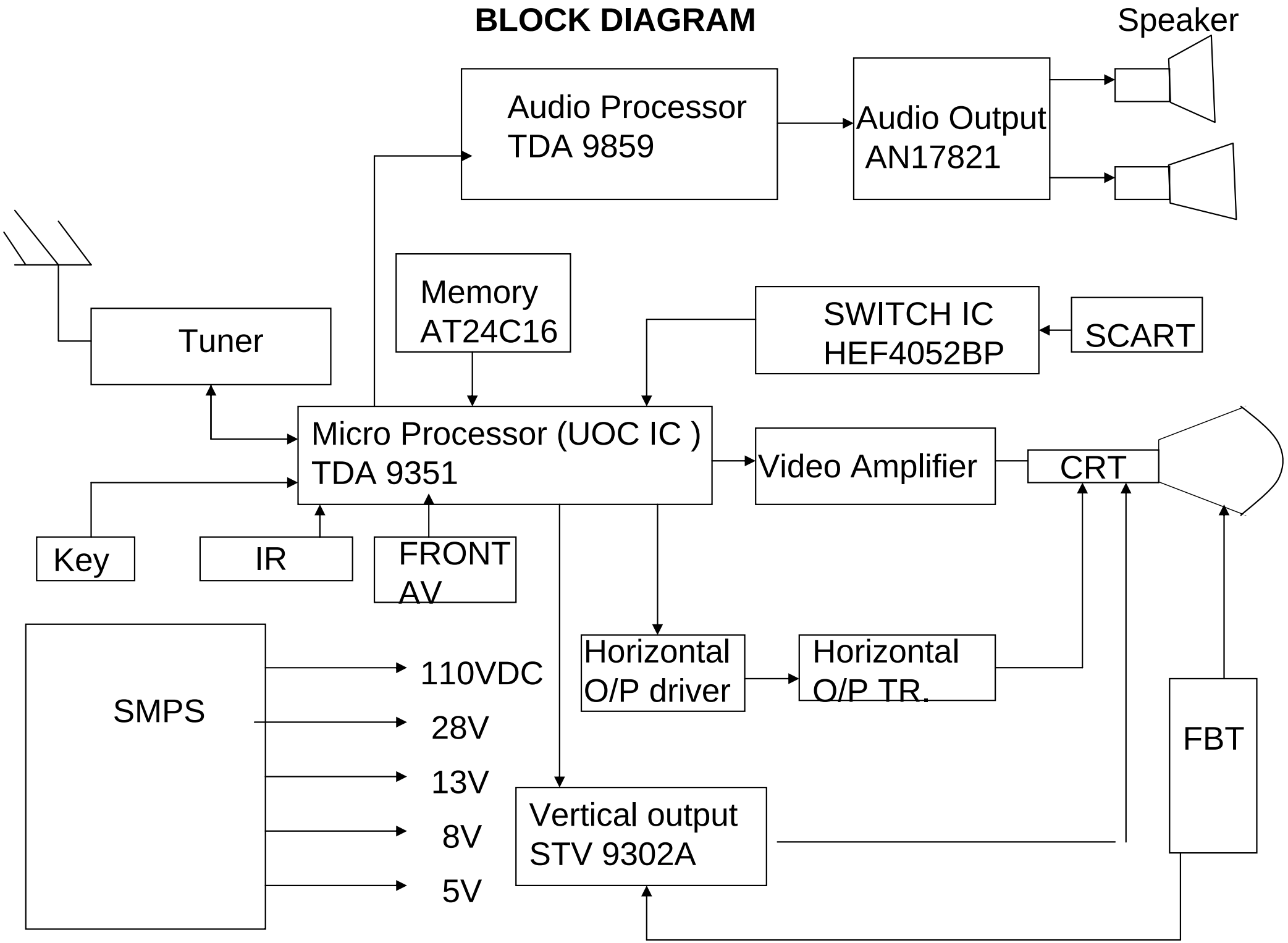
Roadstar®

CTV-1450_2050

Service Manual - CTV-1450_2050

BLOCK DIAGRAM



n.°	livello	descrizione componenti	quant. x TV	un. di misura	prov.	n.° disegno	codice componente
1	1	1) Assieme televisore finito	1	n.°			
2	2	2) Assieme cabinet frontale	1	n.°			1200004770
3	3	3) cabinet frontale verniciato con scritte	1	n.°	LOCAL		**1600005000**
4	4	4) cabinet frontale non verniciato	1	n.°	LOCAL		1200004919
5	5	5) plastica grezza	825,00	g	LOCAL		**1500001000**
6	4	4) vernice	62,70	g	LOCAL		**1500002000**
7	4	4) inchiostro per scritte	0,03	g	LOCAL		**1500003000**
8	4	4) staffa fissaggio cabinet destra	1	n.°	FA		1200001752
9	4	4) staffa fissaggio cabinet sinistra	1	n.°	FA		1200001751
10	4	4) collante per staffe	0,020	g	FA/LOC		**1600008000**
11	5	5) graniglia per collante	0,002	g	FA/LOC		**1600008001**
12	5	5) solvente	0,018	g	FA/LOC		**1600008002**
13	3	3) pulsante accensione verniciato	1	n.°	LOCAL		**1600006000**
14	4	4) pulsante accensione non verniciato	1	n.°	FA		1200002010
15	5	5) plastica grezza	x	g	LOCAL		**1500001000**
16	4	4) vernice	x	g	LOCAL		**1500002000**
17	3	3) molla pulsante accensione	1	n.°	FA		1100001810
18	3	3) pulsantiera verniciata (5 p.)	1	n.°	LOCAL		**1600007000**
19	4	4) pulsantiera non verniciata	1	n.°	FA		1200004935
20	5	5) plastica grezza	x	g	LOCAL		**1500001000**
21	4	4) vernice	x	g	LOCAL		**1500002000**
22	3	3) vite per fissaggio pulsantiera, 4x12BT	2	n.°	FA/LOC		1100001767
23	3	3) logo ROADSTAR CTV 1450-KT	1	n.°	FA		1100009120
24	3	3) coperchio ricevitore IR	1	n.°	FA		1200001478
25	3	3) lente per led e ricevitore IR	1	n.°	FA		1200001725
26	3	3) rondella cinescopio in gomma, 6x22x3mm	4	n.°	FA/LOC		1100001920
27	3	3) colla per rondelle	0,5	g	FA/LOC		1400000138
28	3	3) cinescopio 14", generico, yammato	1	n.°	vedi tab.	vedi tabella p. 2	vedi tabella
29	3	3) vite per fissaggio cinescopio, 5x20 tipo B	4	n.°	FA/LOC		1100001753
30	3	3) cavo di massa per cinescopio	1	n.°	SKD	JE1----B012-A	1100001506
31	3	3) molla con gancio per tensione cavo di massa	1	n.°	LOCAL	ES14AMP01	**1500005001**
32	3	3) bobina di smagnetizzazione	1	n.°	SKD		1100009192
33	3	3) fascetta in plastica, 2.5x100 mm, bianca	4	n.°	FA/LOC	MG3X0020---G7	1100001860
34	3	3) sostegni per bobina smagnet.- filo gommato	4	n.°	SKD	MB5X0005---E3	**1600002000**
35	3	3) cablaggio giogo, 400 mm	1	n.°	SKD	JS4401-A001-P	1100001480
36	3	3) staffa altoparlante sinistro	1	n.°	FA		1200001403
37	3	3) altoparlante, 16Ω, 3W, Φ 90mm	1	n.°	SKD		1100008482
38	3	3) guarnizione altoparlante	1	n.°	FA		1100003355
39	3	3) connettore altoparlante	1	n.°	SKD	JW2321-C001-A	**1600004000**

Bozza

40	3	3) vite per fissaggio altoparlante, 4x12BT	2	n.°	FA/LOC		1100001767
41	3	3) nastro in feltro 25mm per bordo altoparlante	0,04	m	FA/LOC		1100001853
42	3	3) cravatta ferma cavo in metallo, 57 mm	1	n.°	FA/LOC		1100001858
43	3	3) assieme chassis 14"	1	n.°	SKD	vedi tabella p. 2	vedi tabella
44	3	3) cappuccio per pulsante accensione	1	n.°	FA		1200000687
45	3	3) cavo di alimentazione 220 V	1	n.°	SKD	JP2202-V004-X	1100009704
46	3	3) filo gommato nero per cavo alim., 100 mm	1	n.°	FA		1100001861
47	3	3) ferma cavo per cavo alimentazione	1	n.°	FA		1200000758
48	3	3) distanziatore cavo ventosa HV	2	n.°	FA	MG3X0040---G2	1100003293
49	3	3) fascetta in plastica, 2.5x100 mm, bianca	4	n.°	FA/LOC		1100001860

n.°	livello	descrizione componenti	quant. x TV	un. di misura		n.° disegno	codice componente
50	2	**2) Assieme cabinet posteriore**	1	n.°			1200004764
51	3	3) cabinet posteriore non verniciato	1	n.°	LOCAL		1200004800
52	4	4) plastica grezza	1.181,0	g	LOCAL		**1600001001**
53	3	3) nastro in feltro 25mm	0,6	m	FA/LOC		1100001853
54	3	3) etichetta articolo e codice a barre 80x65mm	1	n.°	LOCAL		**1500008001**
55	3	3) vite per assiemaggio cabinet, 4x16BT	4	n.°	FA/LOC		1100004229
56		**Busta accessori**	1	n.°			
57	3	3) libretto istruzioni	1	n.°	LOCAL		1100009248
58	3	3) scheda di garanzia Roadstar	1	n.°	LOCAL		1100010179
59	3	3) schema circuito elettrico CTV 1450KT, VE02	1	n.°	LOCAL		1100010167
60	3	3) lista Centri Assistenza Tecnica	1	n.°	LOCAL		1100010185
61	3	3) etichetta PVC per schermo (POP)	1	n.°	LOCAL		1100009659
62	3	3) telecomando	1	n.°	SKD	BT-0369A---CB	1100009207
63	3	3) batterie per telecomando 1,5 V, UM3, AA	2	n.°	SKD	MT0X0008---T3	1100002593
64	3	3) busta polietilene 235x330 mm	1	n.°	LOCAL		1300000385
65	1	1) Scatola imballo TV	1	n.°			
66	3	3) scatola imballo piana	1	n.°	LOCAL		1300001358
67	3	3) busta TV polietilene, 850x800 mm	1	n.°	LOCAL		1300000388
68	3	3) polistirolo per imballo inferiore (dx e sx)	1	n.°	LOCAL		1300000720 B
69	3	3) polistirolo per imballo superiore (dx e sx)	1	n.°	LOCAL		1300000720 T
70	3	3) etichetta articolo e codice a barre, 57x18 mm	3	n.°	FA		1100001815
71	3	3) nastro adesivo trasparente 72 mm	4,5	m	FA/LOC		1300000769
72		**Materiali di supporto alla lavorazione**					
73	3	3) nastro in carta 12 mm	0,1	m	FA/LOC		1400000151
74	3	3) cartellino di lavorazione "history card"	1	n.°	FA/LOC		1100001770
75	3	3) stagno per saldature	2	g	FA/LOC		1400000301

n.°	livello	descrizione componenti imballo	quant. x imb.	un. di misura	prov.	n.° disegno / specifica	codice componente
1	1	1) Assieme imballo					
2	2	2) televisore imballato	20	n.°			
3	2	2) film polietilene estensibile	30	m	LOCAL		**1600009001**

Legenda provenienza: **FA** = India; **SKD** = Cina; **LOCAL** = locale; **FA/LOC** = India o locale

n°.	Tipo Cinescopio	Provenienza	Codice componente	Tipo Chassis	Provenienza	Codice compon.
1	A34LEX10X	SAMTEL - India	1100001679	VE02 14SMT	SKD	1200004804
2	A34KQW42X01	SAMSUNG SDI - Malaysia	1700001001	VE02 14SMG	SKD	1700002003
3	A33EKC..X..	EKRANAS - Lithuania	1700001002	VE02 14EKR	SKD	1700002004
4						
5						

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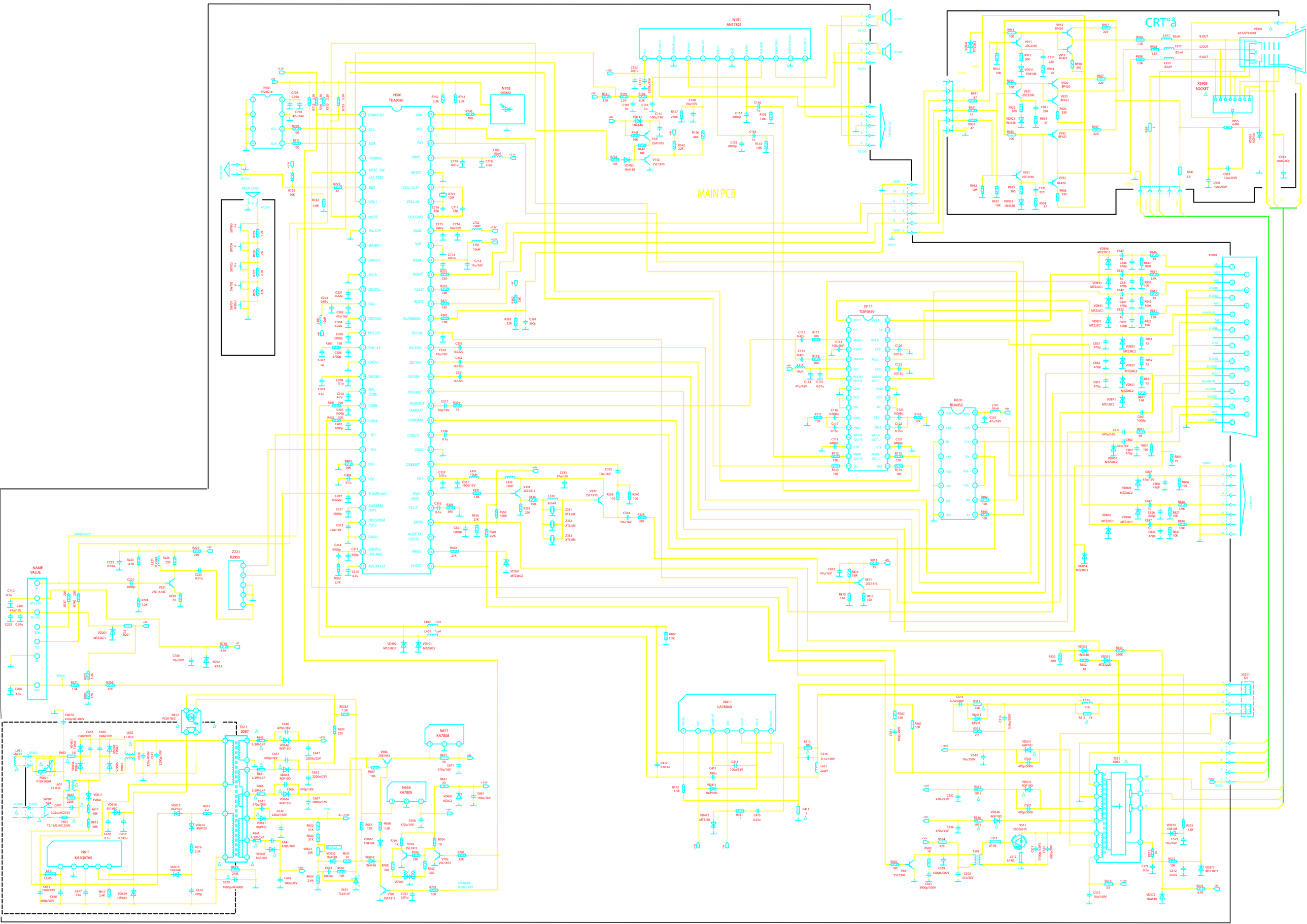

COLOR TELEVISION

SERVICE MANUAL

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SAFETY PRECAUTIONS

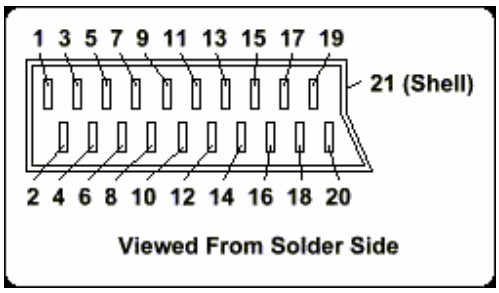
- Do not change any module unless the set is switched off.
- The mains supply side of the SMPS transformer is live. Use an isolating transformer
- Servicing of the CTV set should only be carried out by qualified person.
- Components marked with warning symbol on circuit diagram are critical for safety and must only be replaced with an identical component
- Power resistor and fusable resistors must be mounted in an identical manner to the original component.
- Discharge the capacitors like Main Filter when working on these.
- Do not solder when the set is on.
- Do not connect any external device like Speakers etc. when the set is on.
- When any signals are to be connected/ disconnected switch off the set.
- Wear rubber shoes/non-conducting so that your body does not become a passage for electric current.

INTRODUCTION:-

VE01 chassis is capable of driving 14", 20", 21", 21"PF tubes at appropriate currents. This chassis is capable of working in the PAL / SECAM / NTSC systems. The sound system is capable of giving 1.5W r.m.s. output into a load 8E speaker. One page simple TELETEXT, TOPTEXT and FASTEXT is provided. The chassis is equipped with 21 pin scart connector which can accept via scart the SVHS format from VCRs.

The details of various sections with IC details and pin voltages are covered in this manual. The alignment procedure in field and also at manufacturing line is also covered in detail. The block diagram, circuit diagram and track side layout of VE01 chassis is also attached in this manual for easy reference.

1. PERI- TV SOCKET (SCART)



PIN DETAILS OF SCART

Pin	Name	Description	Signal Level	Impedance
1	AOR	Audio Out Right	0.5 V rms	<1k ohm
2	AIR	Audio In Right	0.5 V rms	>10k ohm
3	AOL	Audio Out Left + Mono	0.5 V rms	<1k ohm
4	AGND	Audio Ground		
5	B GND	RGB Blue Ground		
6	AIL	Audio In Left + Mono	0.5 V rms	>10k ohm
7	B	RGB Blue In	0.7 V	75 ohm
8	SWTCH	Audio/RGB switch / 16:9	0-2 V=TV, 5-8 V=WideScreen, 9.5-12 V=AV Mode	>10 kohm
9	G GND	RGB Green Ground		
10	CLKOUT	Data 2: Clockpulse Out	Unavailable	
11	G	RGB Green In	0.7 V	75 ohm
12	DATA	Data 1: Data Out	Unavailable	
13	R GND	RGB Red Ground		
14	DATAGND	Data Ground		
15	R	RGB Red In / Chrominance	0.7 V (Chroma.: 0.3 V burst)	75 ohm
16	BLNK	Blanking Signal	1-3 V=RGB, 0-0.4 V=Composite	75 ohm
17	VGND	Composite Video Ground		
18	BLNKGND	Blanking Signal Ground		
19	VOUT	Composite Video Out	1 V	75 ohm
20	VIN	Composite Video In / Luminance	1 V	75 ohm
21	SHIELD	Ground/Shield (Chassis)		

2. MICRO CONTROLLER AND SMALL SIGNAL FUNCTION WITH TDA 9351:- This IC is a combination of microcontroller and chroma (Small Signal function). This IC performs all important functions in TV receiver. The details of IC are bifurcated in two parts. Small Signal function and microcontroller

2A:- SMALL SIGNAL FUNCTION:

2A.1: VISION IF AMPLIFIER: The vision IF amplifier can demodulate signals with positive and negative modulation. The PLL demodulator is completely alignment-free. The VCO of the PLL circuit is internal, and the frequency is fixed to the required value by using the clock frequency of the Controller/ Teletext decoder as a reference. The setting of the various frequencies (38, 38.9, 45.75 and 58.75 MHz) can be made via the control bits IFA-IFC in sub address 27H. Because of the internal VCO, the IF circuit has a high immunity to EMC interferences.

2A.2: VIDEO SWITCHES: The video switch has one input for an external CVBS or Y/C signal. The selected CVBS signal can be supplied to pin 38, the IF video output. The selection between both signals is realized by means of the SVO bit in sub address 22H. The video ident circuit can be connected to the incoming 'internal' video signal or to the selected signal. This ident circuit is independent of the synchronisation and can be used to switch the time-constant of the horizontal PLL depending on the presence of a video signal (via the VID bit). Because of the availability of the Y/C input and the subcarrier output an external comb-filter can be applied. In that case an external video switch (or comb-filter with integrated switch) must be used. The subcarrier output is combined with a 3-level output switch (0 V, 4 V and 8 V). The output level and the availability of the subcarrier signal is controlled by the CMB1 and CMB0 bits. The output can be used to switch sound traps etc.

2A.3: SOUND CIRCUIT (QSS VERSION)

The sound IF amplifier is similar to the vision IF amplifier and has an external AGC decoupling capacitor. The single reference QSS mixer is realised by a multiplier. In this multiplier the SIF signal is converted to the intercarrier frequency by mixing it with the regenerated picture carrier from the VCO. The mixer output signal is supplied to the output via a high-pass filter for

attenuation of the residual video signals. With this system a high performance hi-fi stereo sound processing can be achieved. The AM sound demodulator is realised by a multiplier. The modulated sound IF signal is multiplied in phase with the limited SIF signal. The demodulator output signal is supplied to the output via a low-pass filter for attenuation of the carrier harmonics. The AM signal is supplied to the output (pin 44) via the volume control. It is possible to get the AM output signal (not controlled on amplitude) on the QSS intercarrier output. The selection is made by means of the AM bit in subaddress 29H. Another possibility is that pin 35 is transferred to external audio input pin and pin 32 to (non-controlled) AM output pin. This can be realised by means of the setting the control bits CMB0 and CMB1 in subaddress 22H.

2A.4: FM DEMODULATOR AND AUDIO AMPLIFIER (MONO VERSIONS):- The FM demodulator is realised as narrow-band PLL with external loop filter, which provides the necessary selectivity without using an external band-pass filter. To obtain a good selectivity a linear phase detector and constant input signal amplitude are required. For this reason the intercarrier signal is internally supplied to the demodulator via a gain controlled amplifier and AGC circuit. The nominal frequency of the demodulator is tuned to the required frequency (4.5/5.5/6.0/6.5 MHz) by means of a calibration circuit which uses the clock frequency of the Controller/Teletext decoder as a reference. The setting to the wanted frequency is realised by means of the control bits FMA and FMB in control byte 29H. When required an external sound band-pass filter can be inserted in front of the narrow-band PLL. In that case pin 32 has to be switched to sound IF input by means of the bits SIF (subaddress 21H) and CMB0/CMB1 (subaddress 22H). When the sound IF input is selected the subcarrier output or AVL function are not available. From the output status bytes it can be read whether the PLL frequency is inside or outside the window and whether the PLL is in lock or not. With this information it is possible to make an automatic search system for the incoming sound frequency. This can be realised by means of a software loop which switches the demodulator to the various frequencies and then select the frequency on which a lock condition has been found. The deemphasis output signal amplitude is independent of the TV standard and has the same value for a frequency deviation of 25 kHz at the 4.5 MHz standard and for a deviation of 50 Khz for the other standards. The audio control circuit contains an audio switch and volume control. In the mono intercarrier sound versions, the Automatic Volume Levelling (AVL) function can be activated. The pin to which the external capacitor has to be connected depends on the IC version. For the 90 degree types the capacitor is connected to the EW output pin (pin 20). For

the 110 degree types a choice must be made between the AVL function and a sub-carrier output for comb filter applications. This choice is made via the CBM0 and CMB1bits (in subaddress 22H). When the AVL is active it automatically stabilises the audio output signal to a certain level. The signal on the deemphasis pin (28) can be supplied to the SCART connector via a buffer stage. It is also possible to use this pin as additional audio input. In that case the internal signal must, of course, be switched off. This can be realised by means of the sound mute bit (SM in subaddress 29H). When the IF circuit is switched to positive modulation the internal signal on the deemphasis pin is automatically muted. The audio switch is controlled by means of the INA/INB bits in subaddress 22H. It is, however, also possible to overrule the audio switch position by means of the ADS and ADX bits (subaddresses 28H and 21H respectively).

2A.5: SYNCHRONISATION CIRCUIT :- The IC contains separator circuits for the horizontal and vertical sync pulses and a data-slicing circuit which extracts the digital teletext data from the analog signal. The horizontal drive signal is obtained from an internal VCO which is running at a frequency of 25 MHz. This oscillator is stabilised to this frequency by using a 12 MHz signal coming from the reference oscillator of the micro controller/Teletext decoder. The horizontal drive is switched on and off via the soft start/stop procedure. This function is realised by means of variation of the T ON of the horizontal drive pulses. In addition the horizontal drive circuit has a 'low-power start-up' function. The vertical synchronisation is realised by means of a divider circuit. The vertical ramp generator needs an external resistor and capacitor. For the vertical drive a differential output current is available. The outputs must be DC coupled to the vertical output stage. In the types which are intended for 90 degreę picture tubes the following geometry parameters can be adjusted:

- Horizontal shift
- Vertical amplitude
- Vertical slope
- S-correction
- Vertical shift

The types which are intended to be used in combination with 110 degreę picture tubes have an East-West control circuit in stead of the AVL function.

The additional controls for these types are:

- EW width
- EW parabola width
- . EW upper and lower corner parabola correction
- EW trapezium correction
- . Vertical zoom

2A.6: CHROMA AND LUMINANCE PROCESSING: - The chroma band-pass and trap circuits (including the SECAM cloche filter) are realised by means of gyrators and are tuned to the right frequency by comparing the tuning frequency with the reference frequency of the colour decoder. The luminance delay line and the delay cells for the peaking circuit are also realised with gyrators. The circuit contains a black stretcher function which corrects the black level for incoming signals which have a difference between the black level and the blanking level.

2A.7: COLOUR DECODER :- The IC can decode PAL, NTSC and SECAM signals. The PAL/NTSC decoder does not need external reference crystals but has an internal clock generator which is stabilised to the required frequency by using the 12 MHz clock signal from the reference oscillator of the micro controller/Teletext decoder. Under bad-signal conditions (e.g. VCR-playback in feature mode), it may occur that the colour killer is activated although the colour PLL is still in lock. When this killing action is not wanted it is possible to overrule the colour killer by forcing the colour decoder to the required standard and to activate the FCO-bit (Forced Colour On) in subaddress 21H. The Automatic Colour Limiting (ACL) circuit (switchable via the ACL bit in subaddress 20H) prevents that over saturation occurs when signals with a high chroma-to-burst ratio are received. The ACL circuit is designed such that it only reduces the chroma signal and not the burst signal. This has the advantage that the colour sensitivity is not affected by this function. The SECAM decoder contains an auto-calibrating PLL demodulator which has two references, viz: the divided 12 MHz reference frequency (obtained from the microcontroller) which is used to tune the PLL to the desired free-running frequency and the bandgap reference to obtain the correct absolute value of the output signal. The VCO of the PLL is calibrated during each vertical blanking period, when the IC is in search or SECAM mode. The base-band delay line (TDA 4665 function) is integrated. This delay line

is also active during NTSC to obtain a good suppression of cross colour effects. The demodulated colour difference signals are internally supplied to the delay line.

2A.8: RGB OUTPUT CIRCUIT AND BLACK-CURRENT STABILIZATION : In the RGB control circuit the signal is controlled on contrast, brightness and saturation. The ICs have a linear input for external RGB signals. It is possible to use this input for the insertion of YUV signals. Switching between RGB and YUV can be realised via the YUV-bit in subaddress 2BH. The signals for OSD and text are internally supplied to the control circuit. The output signal has an amplitude of about 2 Volts black-to-white at nominal input signals and nominal settings of the various controls. To obtain an accurate biasing of the picture tube the 'Continuous Cathode Calibration' system has been included in these ICs. A black level offset can be made with respect to the level which is generated by the black current stabilization system. In this way different colour temperatures can be obtained for the bright and the dark part of the picture. The black current stabilization system checks the output level of the 3 channels and indicates whether the black level of the highest output is in a certain window (WBC-bit) or below or above this window (HBC-bit). This indication can be read from the status byte 01 and can be used for automatic adjustment of the Vg2 voltage during the production of the TV receiver. During switch-off of the TV receiver a fixed beam current is generated by the black current control circuit. This current ensures that the picture tube capacitance is discharged. During the switch-off period the vertical deflection is placed in an overscan position so that the discharge is not visible on the screen.

2B. - MICROCONTROLLER WITH TELETEX DECODER: - The integrated teletex decoder with embedded microcontroller is a control system designed for TV sets with analogue picture and sound control. The system also offers an on screen display (OSD) and IR remote control of all functions.

3. TUNER: - GDC Tuner EWT 5F3T1 is controlled by I2C bus through IC TDA 9361.The tuning is based on frequency synthesis tunning**.**

CHANNEL COVERAGE :

BAND	OFF AIR CHANELS	
	CHANEL RANGE	FREQUENCY (IN MHZ)
LOW BAND	E2- S9	48.25 – 161.25
MID BAND	S10 – S41	168.25 – 463.25
HIGH BAND	E21 – E69	471.25 – 855.25

4. VIDEO SWITCH BU 4052: The HEF4052 is a dual four channel analog multiplexer. The main function of this device is to accept an AV input from SCART, external AV and switch the required output at pin no Z which is applied to small signal processing IC.

5. SOUND PROCESSOR: TDA 9859 is designed to perform demodulation of FM TV sound. The TDA 9859 selects signal from Three Stereo Sources or Six Mono Sources and out put can be given to scart. The sound processor is I2C bus controlled and all settings of bus are stored in sub address register.

6. SOUND OUTPUT: - IC AN17821 is used as the AF out amplifier for the Stereo application. It is supplied by 13 volts from the 13 volt DC coming from a separate winding in the SMPS transformer. An out power of 1.5 Watt can be delivered into an 8 Ohm Load. This IC is also having a feature of auto volume controller. Similarly stand by signal coming from microcontroller is used to disable the sound out put from speaker.

7. VERTICLE OUTPUT STAGE:- The STV 9302 is a vertical deflection circuit can be used for 90 degree and 110 degree deflection systems . One supply voltage for the scan is required. The drive voltage is amplified by an amplifier. The supply voltage of this IC is 15 Volts.

8. VIDEO OUTPUT AMPLIFIER: The RBG output signal from TDA 9351 is applied to video output amplifier section. IC TDA6107 or transistorized circuit can be used for video signal amplification and to be applied to cathodes of CRT for generation of R, G, and B colors. If IC

is used, then internal amplifiers are used to amplify the video signal. The transistorized amplifier can be designed by using transistor circuit in which 9 transistors are used. Chassis VE01 consist of transistorized video amplifier circuit.

9. POWER SUPPLY: The DC Voltages required at various part of the chassis are applied by SMPS transformer controlled by STR 0765, which is designed for deriving, controlling and protecting switiching transistor of SMPS. The transformer produces 110 volts for FBT, 13 Volt for audio O/p IC, 33 Volts for tuner and 5 and 8 Volts regulated voltages through IC TA7805 and TA7808.

10. MEMORY IC : The 24C16 is a 16 Kilo Bit electrically erasable programmable memory. EEPROM organized as 128 pages X 16 bytes. This is compatible with I2C standards, two wire serial interface which uses a bi directional data bus and serial clock.

11. IC DISCRIPTION AND PIN DETAILS

- TDA 9351→ TV Signal processor- Teletex decoder with embedded microcontroller
- HEF 4052BP-→ Video Switch
- STV 9302-→ Vertical Deflection Output
- 24C16-→ Memory IC
- TDA 9859-→ Sound Processor
- AN 17821-→ Sound Output
- KA 5Q0765-→ STR
- Video amplifier.

11A. TDA 9351:- This IC is the functions of a TV signal processor together with a microcontroller and US Closed Caption decoder. The IC is used in television receivers with 90degree and 110 degreę picture tubes. The ICs have supply voltages of 8 V and 3.3 V and they are mounted in S-DIP envelope with 64 pins. This IC is having higher degree of integration because delay line with adjustable delay time, PAL / SECAM / NTSC decoder has been integrated. In addition to this some special features like Continuous Cathode Calibration', white point and black level offset, AVL are added in this version. As this is a combination of microcontroller and TV signal processor, the features of IC are divided in two sections

TV Signal processor Important Features

- Internal (switchable) time-constant for the IF-AGC circuit.
- A choice can be made between versions with mono intercarrier sound FM demodulator and versions with QSS IF amplifier.
- The mono intercarrier sound versions have a selective FM-PLL demodulator which can be switched to the different FM sound frequencies (4.5/5.5/6.0/6.5 MHz).The quality of this system is such that the external band-pass filters can be omitted.
- Source selection between 'internal' CVBS and external CVBS or Y/C signals
- Integrated chrominance trap circuit
- Integrated luminance delay line with adjustable delay time
- Asymmetrical 'delay line type' peaking in the luminance channel
- Black stretching for non-standard luminance signals

- Integrated chroma band-pass filter with switchable centre frequency
- Only one reference (12 MHz) crystal required for the microcontroller, Teletext- and the colour decoder
- PAL/NTSC or multi-standard colour decoder with automatic search system
- Internal base-band delay line
- RGB control circuit with 'Continuous Cathode Calibration', white point and black level offset adjustment so that the colour temperature of the dark and the light parts of the screen can be chosen independently.
- Linear RGB or YUV input with fast blanking for external RGB/YUV sources. The Text/OSD signals are internally supplied from the microcontroller/Teletext decoder
- Contrast reduction possibility during mixed-mode of OSD and Text signals
- Horizontal synchronization with two control loops and alignment-free horizontal oscillator
- Vertical count-down circuit
- Vertical driver optimized for DC-coupled vertical output stages
- Horizontal and vertical geometry processing
- Horizontal and vertical zoom function for 16 : 9 applications
- Horizontal parallelogram and bow correction for large screen picture tubes

Special Features of micro Controller

- 80C51 microcontroller core standard instruction set and timing
- 1 microsecond machine cycle
- 32 - 128Kx8-bit late programmed ROM
- 3 - 12Kx8-bit Auxiliary RAM (shared with Display and Acquisition)
- Auxiliary RAM page pointer
- 16-bit Data pointer
- IDLE and Power Down (PD) mode
- 14 bits PWM for Voltage Synthesis Tuning
- 8-bit A/D converter
- 4 pins which can be programmed as general I/O pin, ADC input or PWM (6-bit) output
- Text memory for 1 or 10 pages

- In the 10 page versions inventory of transmitted Teletext pages stored in the Transmitted Page Table (TPT) and Subtitle Page Table (SPT)
- Data Capture for 525/625 line WST, VPS (PDC system A) and Wide Screen Signalling (WSS) bit decoding
- Automatic selection between 525 WST/625 WST
- Automatic selection between 625 WST/VPS on line 16 of VBI
- Real-time capture and decoding for WST Teletext in Hardware, to enable optimized □-processor throughput
- Automatic detection of FASTEXT transmission
- Real-time packet 26 engine in Hardware for processing accented, G2 and G3 characters
- Signal quality detector for video and WST/VPS data types
- Comprehensive teletext language coverage
- Full Field and Vertical Blanking Interval (VBI) data capture of WST data

Display Features

- Teletext and Enhanced OSD modes
- Single/Double/Quadruple Width and Height for characters
- Scrolling of display region
- Variable flash rate controlled by software
- Enhanced display features including over lining, underlining and italics
- Soft colours using CLUT with 4096 colour palette
- Globally selectable scan lines per row (9/10/13/16) and character matrix [12x10, 12x13, 12x16 (VxH)]
- Fringing (Shadow) selectable from N-S-E-W direction
- Fringe colour selectable
- Meshing of defined area
- . 32 software redefinable On-Screen display characters

PINNING: TDA 9351

Pin No	Description	Value
1. Stand By	Stand by	Low Level: 0 High Level : 3.31V
2. SCL	Clock Signal Output	Low level : 0V High Level : 3.31V
3. SDA	Data Out put	Low Level : 0V High Level : 3.31V
4.TUNING	Tunning (Not connected)	4 V
5. NTSC SW / AC TEST	NTSC switch , AC Test	0V
6. KEY	Key Input (Pannel)	Low Level : 3.36V High level : 3.48V
7. VOL1	Volume	3.3 V
8. MUTE	Mute	Low level : 0V High Level : 4.06
9. Vss C/P	Digital Ground for microcontroller	0V
10. BAND1	Band 1 (not connected)	0V
11. BAND2	Band 2 (Not Connected)	0V
12. Vss A	Analog ground of teletext decoder and digital ground for TV processor	0V
13. SECPLL	Secam PLL decoupler	Low level : 0V High level : 2.27
14. Vp2	Second supply voltage for TV processor	8V
15. DECDIG	Decoupling digital supply of TV processor	Low level : 0V High level : 4.98V
16.PHL2LF	Phase II filter	Low level : 0V High level : 2.88V
17. PHL2LF	Phase I filter	Low level : 0V High Level : 3V

18. GND3	Ground for TV processor	0V
19. DECBG	Band gap decoupling	3.97 V
20. AVL / EWD	Automatic volume leveling / East west drive output	Low level : 0 High level : 2.61V
21. VDRB	vertical drive B output	0.59V
22. VDRA	vertical drive A output	0.61
23. IF1	IF input 1	1.85V
24. IF2	IF input 2	1.85V
25. IREF	Reference current input	3.97V
26. VSC	Vertical sawtooth capacitor	Low level : 0V high level : 3.65V
27. TUNER AGC	Tuner AGC output	Low level : 0V high level : 3.93V
28. AUDDEM	Audio de emphasis or SIF input 1	3.14V
29. DECSDEM / SIF2	Decoupling sound demodulator or SIF input2	2.23V
30. GND2	Ground 2 for TV processor	0V
31. SNDPLL / SIF AGC	Narrow band PLL filter /AGC sound IF	2.23V
32. AVL / REF0	Automatic Volume Levelling / sound IF input / subcarrier reference output /AM output	0V
33. H OUT	Horizontal output	0.53V
34. FBISO	Flyback input/sandcastle output	0.67V
35. AUDEXT / QSSO	External audio input /QSS intercarrier out /AM audio output (non controlled)	3.64V
36. EHTO	EHT/Over voltage protection input	Low level : 0V High Level : 1.6V

37. PLL IF	IF-PLL loop filter	Low level : 0V High Level : 2.35V
38. IFVO / SVO	IF video output / selected CVBS output	3.27V
39. Vp1	Main supply voltage TV-processor (+8 V)	8V
40. CVBSINT	Internal CVBS input	2VPP
41. GND1	Ground 1 for TV-processor	0V
42. CVBS / Y	External CVBS/Y input	Low level : 0V High Level : 3.3V
43. CHROMA	Chrominance input (SVHS)	Low level : 0V High Level : 3.3V
44. AUDOUT / AMOUT	Audio output /AM audio output (volume controlled)	3.31V
45. INSSW2	2nd RGB / YUV insertion input	0V
46. R2 / VIN	2nd R input / V (R-Y) input	2.49V
47. G2 / YIN	2nd G input / Y input	2.49V
48. B2 / UIN	2nd B input / U (B-Y) input	2.49V
49. BCLIN	Beam current limiter input/V-guard input	1.95 V
50. BLANKING	Black current input	3 V
51. ROUT	Red output	2Vpp
52. GOUT	Green output	2Vpp
53. BOUT	Blue output	2Vpp
54. VddA	Analog supply of Teletext decoder and digital supply of TV-processor	3.3V
55. VpE	OTP Programming Voltage	0V
56. VddC	Digital supply to core	3.3V
57. OSCGND	Oscillator ground supply	0V

58. XTAL IN	Crystal oscillator input	1.57V
59. XTAL OUT	Crystal oscillator output	1.76V
60. RESET	Reset	0V
61. VddP	Digital supply to periphrery	3.3V
62. AV1	AV input from video switching IC (+3.3 V)	0.06V
63. AV2	AV input from video switching IC (+3.3 V) input	0.6V
64. IRIN	IR Input	4.8V

11B. IC-BU4052:- 16 Pin IC. This IC is used for video switching The HEF 4052B is a dual four channel analog Multiplexer / De- Multiplexer with common channel; select Logic. Each Multiplexer / De-Multiplexer has four independents inputs / out puts. (Yo to Y_3) and a common input / out put (Z) . The Common Channel Select Logic includes two address inputs (A0 and A1) and an active low enable input INH. Both Multiplexer / De Multiplexer has four bi directional analog switches, each with one side connected to an independent input / out put. . (Yo to Y_3) and the other side connected to common input / out put (Z). For operation as a digital multiplexer / demultiplexer VEE is connected to VSS (typically ground).

Application Information :

- Analog Multiplexing and De-Multiplexing.
- Digital Multiplexing and demultiplexing.
- Signal Gating

PINNING: HEF 4052BP

Pin no.	Pin Description	Voltage in Volts (1 Khz Colour Pattern)
1. Y0B	(independent inputs/ Out puts)	0.50V
2. Y2B	Y2/ out B (independent inputs / out puts)	0.50V

3. ZB	(Common input / outputs)	0.50V
4. Y3B	(independent inputs / out puts)	0.50V
5. Y1B	(independent inputs / out puts)	0.40 V
6. INH	(enable input (active LOW))	0
7. VEE	VEE	0
8. VSS	VSS	0
9. A1	(address inputs)	0.21V
10. A0	(address inputs)	0.21V
11. Y3A	(independent inputs / out puts)	0.21V
12. Y0A	(independent inputs / out puts)	0
13. ZA	(Common input / outputs)	0
14. Y1A	(independent inputs / out puts)	0.20V
15. Y2A	(independent inputs / out puts)	0.07V
16. VDD	VDD	7.96V

11C. STV 9302A (VERTICLE IC) : The STV 9302A is a vertical deflection booster designed for T.V applications . This device supplied with upto 35 volts and provides upto 2 Vpp current to derive the vertical deflection yoke**.**

Features:

- Power Amplifier.
- Fly Back generator
- Output Current upto 2 amp.
- Thermal Protection.

PINNING: STV 9302

Pin no.	Pin Description	Voltage in Volts (1 Khz Colour Pattern)
1	INPUT(INVERTING)	0.59 V
2	SUPPLY VOLTAGE	14 V
3	FLY-BACK GENERATOR	-11.43 V
4	Gnd or Negative supply	-12.82 V
5	OUT PUT	0.33V
6	OUTPUT-STAGE SUPPLY	14.29 V
7	INPUT(NON INVERTING)	0.61 V

11D. IC-AT24C16:- This is a 16 Kilo Bite EEPROM with a wide operating range**.**

Features:

- Data EEPROM internally organized as 2048 bytes and 128 pages X 16 bytes.
- Low power C-MOS.
- Vcc = 2.7 – 5.5 Volt operation.
- Two wire serial interface bus, I^2C- Bus Compatible.
- Filtered Inputs for Noise Suppression with Schmitt Trigger.
- Clock frequency upto 400 KHz.
- High Programming flexibility.
- High reliability
  - Endurance 10^6 Cycles
  - Data retention 40 Years.
  - ESD protection 4000V on all pins.
- 8 Pin DIP/ DSO packages.
- Available for extended temperature ranges.
  - Industrial -40^0C to $+ 85^0C$
  - Automotive -40^0C to $+ 125^0C$.

PINNING :- 24C16

Pin No	Pin Description	Stand-By Voltage	ON Condition Voltage (1 Khz Colour Pattern)
1	GND	0 V	0 V
2	GND	0 V	0 V
3	GND	0 V	0 V
4	GND	0 V	0 V
5	SDA. Serial Data Input	3.12 V	3.23 V
6	SCL. Serial clock	2.54 V	2.56 V
7	GND	0 V	0 V
8	VCC	5 V	5 V

11E. IC-TDA9859 (SOUND PROCESSOR) :- TDA 9859 sound processor provides the sound control facilities for the main and the scart channel of a T.V set. Due to extended switching possibilities Signal from three stereo sources can be handled. This is plastic shrink dual in line package 32 pin IC.

Features:

- I2 C bus control for all functions
- Multi Source Selector Switches.
- Six AF Inputs (Three Stereo Sources or Six Mono Sources can be used as a input.)
- Each of the input signal can be switched to each of outputs.
- Out put for large speaker channels and pary –TV Connector scart,
- Stereo and pseudo stereo effects.
- Audio surround decoder can be added externally.
- To general purpose out put port.

PINNING: TDA 9859

Pin no.	Pin	Pin Description	Stand By Voltage
1	AV Left input	Scart Input Left Channel	Low Level : 0.32V High Level : 3.8V
2	P 1 Not connected	Port -1 Input	0
3	MAIN Left	Main Input Left Channel	0 Low Level : 0V High Level : 3.8V
4	CSMO	Smoothing Capacitor of reference voltage	Low Level : 0.02V High Level : 8V
5	MAIN Right	Main Input Right Channel	Low Level : 0V High Level : 3.8V
6	VCC	Supply Voltage	Low Level : 0.02V High Level : 8V
7	AUDIO OUT Right	Scart Out put right Channel	Low Level : 0.05V High Level : 3.8V
8	GND	Ground	0
9	VO 2	Main Out put Right Channel	Low Level : 0.17V High Level : 3.8V
10	VI 8	Input to Loud Speaker Channel	Low Level : 0.16V High Level : 3.8V
11	CBR 1	Bass Capacitor Connection-1 Right Channel	Low Level : 0.15V High Level : 3.8V
12	CBR 2	Bass Capacitor Connection-2 Right Channel	Low Level : 0.14V High Level : 3.8V
13	Woofer out Right(N.C)	Woofer Out Right	0
14	CTR	Treble Capacitor Connection right CH.	Low Level : 0V High Level : 3.8V
15	MAIN OUT Right	Loud Speaker Output Right Channel	Low Level : 0V High Level : 3.8V

16	SCL	Serial Clock Input	Low Level : 2.54V High Level : 2.55V
17	SDA	Serial Data Ip / Output	Low Level : 3.10V High Level : 3.27V
18	MAIN OUT Left	Loud Speaker Out Put Left Channel	Low Level : 0V High Level : 3.8V
19	CTL	Treble Capacitor Connection Left Channel	Low Level : 0.10V High Level : 3.8V
20	Woff. Out Left (N.C)	Woofer Output Left	0
21	CBL 2	Bass Capacitor Connection-1 Left CH	Low Level : 0.32V High Level : 3.8V
22	CBL 1	Bass Capacitor Connection-2 Left CH.	Low Level : 0.29V High Level : 3.8V
23	VI 7	Input to Loud Speaker Left Channel	Low Level : 0.27V High Level : 3.8V
24	VO 1	Main Output Left CH	Low Level : 0.25V High Level : 3.8V
25	GND		0
26	AUDIO OUT Left	Scart Output Left Channel	Low Level : 0.05V High Level : 3.8V
27	CPS 2	Pseudo Stereo Capacitor -2	Low Level : 0.23V High Level : 3.8V
28	AV 2 Left	AV2 Left	Low Level : 0.22V High Level : 3.8V
29	CPS 1	Pseudo Stereo Capacitor -1	Low Level : 0.20V High Level : 3.8V
30	AV 2 Right	AV2 Right	Low Level : 0.19V High Level : 3.8V
31	P 2 (NC)	Port-2 Output	0
32	AV1Right	Scart Input Right	Low Level : 0.18V High Level : 3.8V

11F. SOUND OUTPUT IC: the IC AN178421 is used as the AF out amplifier for the Stereo application. It is supplied by 13 volts from the 13 volt DC coming from a separate winding in the SMPS transformer. An out power of 1.5 Watt can be delivered into an 8 Ohm Load.

PINNING:- AN17821

Pin No	Description	Voltage in Volts
1	VCC	13V
2	Channel 1 out put	Low Level : 0V High Level : 6.07V
3	Ground for channel out put	0V
4	Chanel out (-)	Low Level : 0V High Level : 6V
5	Standby Signal Input	Low Level : 0V High Level : 5V
6	Channel 1 input	Low Level : 0V High Level :1.44V
7	Ground	0V
8	Channel 2 input	Low Level : 0V High Level : 1.44V
9	Volume	2.8V
10	Channel 2 out put (-)	Low Level :0V High Level : 6V
11	Ground for channel 2	0V
12	Channel 2 out put	Low Level : 0V High Level : 6V

11G. STR 5Q0765:-The 5QO765RT is a power switch and an enhanced high performance controller. This power switch consists of high voltage power sensitivity and PWM controller IC. PWM Controller features integerated fixed oscillator under voltage lock out, leading edge blanking, optimized gate turn off drivers, thermal shut down protection, over voltage protection. It has a basic platform well suited for cost effective

design in CTV power supply. With this features it offers really safe and reliable power management

Features :

- Quasi resonant convertor controller.
- Internal bus mode controller.
- Pulse by pulse current limiting.
- Over current latch protection.
- Over Voltage protection(V-Sink Min 11 Volt).
- Internal thermal Shut Down function.
- Under Voltage lock out.
- Internal High Voltage sensitivity
- Auto restart mode.

PINNING : STR 5Q0765

Pin No	Description	Voltage (in Volts)
1	Drain	300 V
2	Ground	0
3	VCC	Low level: 12.59V High level: 40V
4	Feedback	Low level : 0.3 V High level: 6.9V
5	SYNC	Low Level : 0.74V High Level :11V

11. VIDEO AMPLIFIER STAGE:- Transistorised amplifier circuit is used to amplify the R,G,B signal received from TDA9351. The R,G,B output from TDA9351 is applied to base of B911,B921 and B931 and push pull amplifier is used to amplify this signal further and applied to cathode of CRT. Voltage details of 9 transistors used in video amplifier section are as follows.

Transistor	Base Voltage	Collector Voltage	Emitter Voltage
B931	3.95 V	88.9V	3.35V
B911	3.98V	87.1V	3.38V
B921	4V	86.1V	3.42V
V923	86V	6.8V	86.4V
V932	88.7V	170.4V	89V
V912	86.9V	175.2V	87.3V
V913	87.1V	6.82V	87.4V
V933	88.7V	6.83V	89V
V922	85.9V	175V	86.2V

12. VE01 CHASSIS MANUAL ALIGNMENT PROCEDURE

In order to enter in service menu and design menu following procedure needs to be followed.

- **12A. Procedure to enter in service mode**

1) Press Menu Key on Remote Handset.
2) Press 6483 on remote handset.
3) M – appears on the Screen.
4) Press 1234, set will enter into Service Mode.
5) To Change the value of parameter press Volume + / Volume – Key, To move from one parameter to another press Channel + / Channel – Key on Remote Handset.
6) Press Stand By Key on remote handset to come out of Service Mode.

- **12B. Procedure to Enter Into Design Mode**

1) Press Menu Key on Remote Handset.
2) Press 6483 on remote handset.
3) M – appears on the Screen.
4) Press 5 on remote handset.
5) Press Lock key on remote handset, set will enter into Design Mode.

6) To Change the value of parameter press Volume + / Volume – Key, To move from one parameter to another press Channel + / Channel – Key on Remote Handset.
7) Press “Stand-By” Key to come out of Design Mode.

- **12C. White Balance Adjustment**:- (**In Field**)

1) Select R,G, B cut off parameter in Menu 3 of service mode and adjust these parameters. Standard settings of these parameters are RD=32, GD=32, BD=32
2) Select the RGB drive parameters RB, GB in menu 3 and adjust this parameter. Default setting of these parameter is RB= 32, GB=32.
3) Select Sub brightness parameter SB in menu 3 and adjust to get proper white balance. The default value of SB=40.

- **12D. Screen Adjustment :-** (In Field)

1) Select parameter SC in menu 3 of service mode .
2) Increase the value of SC by using channel up key so that thin white line will be visible on the screen
3) Adjust the screen intensity by varying screen pot of fbt using insulated screw driver until a thin horizontal line is just visible.

12E. **OTHER SERVICE MODE ADJUSTMENTS**: - can be done by entering into service mode by applying the suggested procedure and setting the default value mentioned below. Few cases defaults values can be changed in a small variation for customer satisfaction.

SERVICE PRAMETERS: MENU 1

Parameter	Variation	Default Setting	Remarks
V SLOPE	0-63	31 for 50Hz & 36 for 60Hz	For adjusting picture vertical center
V SHIFT	0-63	41 for 50Hz & 36 for 60Hz	For shifting picture vertical position
V SIZE	0-63	31 for 50Hz & 36 for 60Hz	For adjusting Vertical amplitude
V SC	0-63	10 for 50Hz & 10 for 60Hz	For adjusting Vertical S-Correction
H SHIFT	0-63	38 for 50Hz & 37 for 60Hz	For adjusting picture H position
PROG NO.		**1.**	

SERVICE PRAMETERS: MENU 2

Parameter	Variation	Default Setting	Remarks
AGC	0-63	28	For RF AGC adjustment
Search Speed	0-3	0	

SERVICE PRAMETERS: MENU 3

Parameter	Variation	Default Setting	Remarks
BT	0-100	75	
CT	0-100	50	
SC		3	Screen variation.
RB	0-63	32	R drive.
GB	0-63	32	G Drive
RD	0-63	32	R cut off
GD	0-63	32	G cut off
BD	0-63	32	B cut off
SB	0-63	42	Sub brightness

SERVICE PRAMETERS: MENU 4

Parameter	Variation	Default Setting	Remarks
OSD.V.POS	0-63	16 for 50Hz & 8 for 60Hz	To adjust OSD Vertical position
OSD.H.POS	0-63	27 for 50Hz & 24 for 60Hz	To adjust OSD horizontal position

DESIGN PRAMETERS: MENU 0

Parameter	Variation	Default Setting
SUB CONTRAST	0-63	63
SUB COLOR	0-63	63
SUB SHARPNESS	0-63	63
SUB TINT	0-63	31
FS-VL-H	0-255	0
FS-VL-L	0-255	0
FS-VH-H	0-255	0
FS-VH-L	0-255	0
RGB.HSH.OFFSET	0-15	6

DESIGN PRAMETERS: MENU 5

Parameter	Variation	Default Setting
PP Mode		Std / dynamic / mild
Brightness	0-100	75 / 75 / 75
Contrast	0-100	75 / 100 / 50
Color	0-100	50 / 50 / 50
Sharpness	0-100	50 / 50 / 50
SC Brightness	0-63	20
Cool BD Offset	0-32	10
Warm RD Offset	0-32	10
YD PAL	0-15	8
YD NTSC	0-15	8
YD SECAM	0-15	8
YD AV PAL	0-15	8
YD AV NTSC	0-15	8
YD AV SECAM	0-15	8

DESIGN PRAMETERS: MENU 6

Parameter	Variation	Default Setting
OSO	0-1	1
AGC SPEED	0-3	1
FFI	0-1	0
FSL	0-1	0
FMWS	0-1	0
HP2	0-1	0
RPO	0-1	1
NTSC MATRIX	JAPAN / U.S	USA
VOL PIN	OPEN DRAIN/ PUSH PULL	OPEN DRAIN
VIDEO OUT	IF / CVBS	IF

DESIGN PRAMETERS: MENU 7

Parameter	Variation	Default Setting
IF	38.9 / 38 / 58.75/ 45.75	38.9MHZ
DK	OFF / ON	ON
I	OFF / ON	ON
BG	OFF / ON	ON
M	OFF / ON	OFF
SIF PRIORITY	DK/ I/ M/ BG	BG
AV2	OFF/ ON	OFF
SVHS	OFF/ON	ON
YUV	OFF/ON	OFF
EURO AV	OFF/ON	ON
S CURVE P1	0-70	20
S CURVE V1	0-75	40
S CURVE P2	0-100	70
S CURVE V2	0-100	75

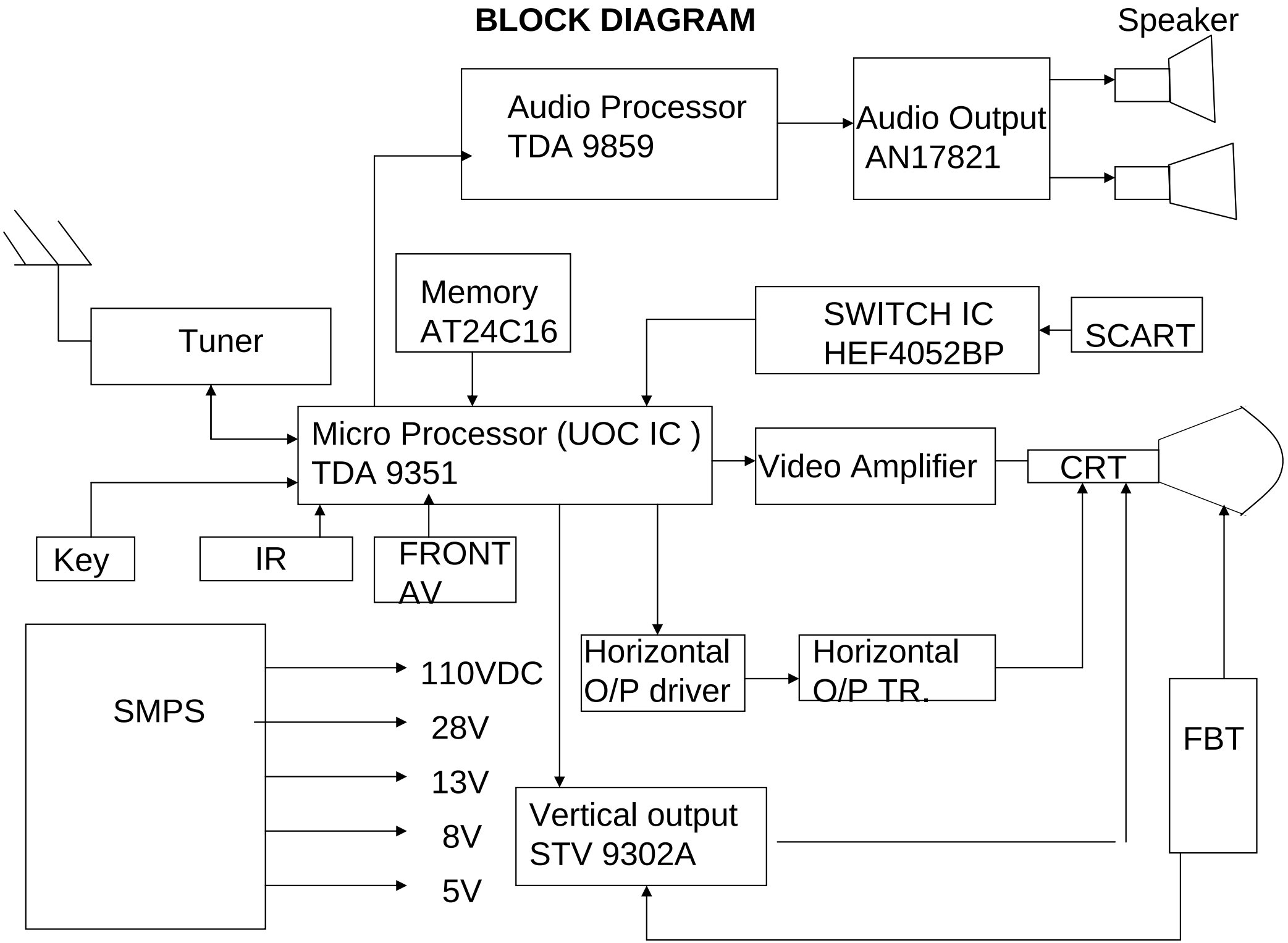
DESIGN PRAMETERS: MENU 8

Parameter	Variation	Default Setting
CATHOD LEVEL	0-15	4
UOC VOLUME	OFF / ON	OFF
FM ATT	0-63	50
TDA 9874 AVL	0-3	1
TDA 9874 CAIN	0-30	15
DUAL OUT	OFF / ON	OFF
AUTO SOUND	OFF / ON	ON
HEADPHONE	0-3	0
TRU BASS	0-1	0
DEFAULT LANG	0-17	0
LANG OPT	FRENCH / RUSSIAN / RU	FRENCH
LANG SW	ON / OFF	ON

DESIGN PRAMETERS: MENU 9

Parameter	Variation	Default Setting
BAND MODE	0-2	1
START ON	0-2	1
ON DELAY	6-15	10
LOGO	OFF / ON	OFF
NVM LOGO	OFF / ON	OFF
TXT BRIGHTNESS	0-63	20
SPANISH BIT	OFF / ON	OFF
NOT 0	OFF / ON	ON
NOT 1	OFF / ON	ON
NOT 2	OFF / ON	ON
NOT 3	OFF / ON	ON
NOT 4	OFF / ON	ON
ZOOM	V63	V56
WIDE	V0	V2

BLOCK DIAGRAM



VE01 CHASSIS ALLIGNMENT PROCEDURE ON MANUFACTURING LINE

PRODUCT : CTV	STAGE: HARNESING AT F-A LINE	PCB/ASSY :F.A.	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		CUTTER	
1	110006308		TIE,CABLE,PLASTIC,2.5X100mm	2			

1 WRAP THE SPEAKER CONNECTOR TO TIE CABLE METAL SLEEVE AT SPEAKER FITTING SCREW.
2 TIE THE SPEAKER CONNECTOR TO RIGHT SIDE PORTION OF DEGAUSSING COIL SUCH THAT IT WOULD NOT HANG OVER THE CHASSIS.
3 TIE THE DEGUASSING COIL CONNECTOR TO DEGAUSSING COIL.
4 CUT THE EXCESS LENGTH OF ALL THE TIES.
DO NOT LEAVE ANY CUT PORTION OF TIE ON THE CHASSIS.

PRODUCT : CTV	STAGE: SWITCH ON	PCB/ASSY :	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1			

1 BEFORE SWITCHING ON THE TV SET , CHECK THAT CHASSIS DOCKING AND HARNESING HAVE DONE PROPERLY OR NOT.
2 CHECK THAT DEGAUSSING CONNECTOR HAS CONNECTED.
3 CONNECT RF SIGNAL TO TUNER.
4 SWITCH ON THE TV SET AND ADJUST THE 'SCREEN' AND 'FOCUS' POT OF FBT FOR CLEAR PICTURE.
5 CHECK THAT POWER ON LED IS GLOWING WITH NORMAL INTENSITY.
6 CHECK POWER ON/OFF SWITCH OPERATION BY SWITCHING THE SWITCH ON/OFF TWO TO THREE TIMES.
7 CHECK FOR THE PROBLEMS LIKE CPT GAP, SWITCH OFF SPOT, STRAY EMISSION ,ETC.
8 SELECT CHANNEL "EU 2CH" AND CHECK THAT 'SUB BRIGHTNESS' PATTERN HAS APPEARED .
9 CHECK FOR CHANNEL TUNNING, ELSE TUNE THE PROGRAMS USING "AUTO SEARCH" IN SEARCH MENU.
10 CHECK THE VOLUME VARIATION FROM ZERO TO MAXIMUM. OBSERVE THAT VARIATION IS NOT INTERMITANT. IT SHOULD BE
11 CHECK THE OPERATION OF CH UP/ CH DN/ VOL UP/ VOL DN/ MENU KEYS .
12 CHECK THAT THESE KEYS ARE NOT HARD TO OPERATE.
13 CHECK THE TV SET ASTHETICALLY

PRODUCT : CTV	STAGE: +B VOLTAGE ALIGNMENT	PCB/ASSY :F.A.	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		DIGITAL PANEL METER	
1			TV SET	1		ALIGNER	
2						REMOTE	CHECKED BY

1 SWITCH ON THE SET.
2 CONNECT THE RF CORD TO TUNER.
3 SELECT THE 'STANDARD' MODE OF PICTURE CONTROL.
4 CONNECT THE DPM POSITIVE PROBE TO CATHODE OF DIODE "VD631" .
(DPM NEGATIVE PROBE IS INTERNALLY CONNECTED TO CHASSIS GROUND)
5 ROTATE THE PRESET "VR 631" USING ALIGNER TO SET +B VOLTAGE + 115V +/- 0.5V DC

PRODUCT : CTV	STAGE: SCREEN ADJUSTMENT	PCB/ASSY :FA	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1		FEVIBONAD	
2						INSULATED SCREW	CHECKED BY
3						DRIVER	

NOTE : WARM UP THE TV SET FOR AT LEAST 20 MINUTES (DURING SOAKING AREA)

1 SELECT DIGITAL / RETMA / LION HEAD PATTERN ,
2 PRESS "MENU+6483" KEYS SEQUENCE TO ACCESS THE MANUFACTURING MODE.
3 PRESS KEY '3' TO APPEAR 'SERVICE MENU 3' ON SCREEN.
4 SELECT PARAMETER "SC " BY PRESSING CHANNEL UP/DN KEY .
5 PRESS 'VOL UP' KEY THEN A THIN HORIZONTAL LINE WILL BE DISPLAYED ON SCREEN.
6 ADJUST THE SCREEN INTENSITY BY VARYING SCREEN POT OF FBT USING INSULATED SCREW DRIVER UNTIL A THIN HORIZOI LINE IS JUST VISIBLE.
7 PRESS "VOL DN" KEY TO APPEAR ORIGINAL PATTERN.
8 APPLY THE FEVIBOND ON "SCREEN" POT. OF FBT.

PRODUCT : CTV	STAGE: FOCUS AND CONVERGENCE	PCB/ASSY : F.A.	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1		GLUE	
2						PNUE. SCREW DRIVER	CHECKED BY
3							
						FEVIBONAD	
						INSULATED SCREW	APPROVED BY
						DRIVER	

TIGHTENING TORQUE OF SCREW DRIVER- 10 TO 15 kg.cm and TV SET IS FACING TOWARDS EAST.

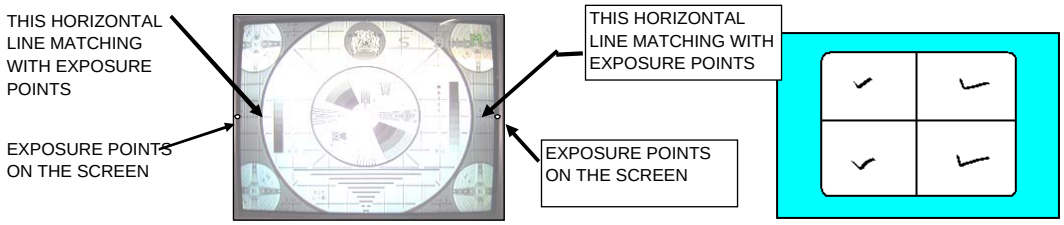
FOCUS ADJUSTMENT :-

1 SELECT LION HEAD PATTERN.(EU 5CH) . CHOOSE SELECTABLE PICTURE MODE "STANDARD".
2 ADJUST THE FOCUS KNOB ON FBT USING INSULATED SCREW DRIVER , SO THAT '30' AT THE DIAGONAL CENTRE ON LION HEA WILL GET AS SHARP AS POSSIBLE.

✓ THIS SYMBOL INDICATES THE LOCATION OF FOCUS ADJUSTMENT CHECK ON SCREEN.

CONVERGENCE ADJUSTMENT :-

1 SWITCH OVER TO CROSS HATCH PATTERN.
2 BY TURNING THE 4 POLE MAGNET, MATCH THE RED AND BLUE LINES AT THE CENTRE. SHIFT THE RED AND BLUE LINE OVER THE GREEN LINE BY USING 6 POLE MAGNET.
3 TIGHTEN THE CPM LOCK. BE CAREFUL NOT TO MOVE THE OTHER RINGS/MAGNETS AT THIS TIME.
4 CHECK AND ADJUST THE PICTURE FOR TILT.ADJUST THE TILT BY ADJUSTING THE YOKE.
5 APPLY GLUE ON BOTH SCREEN AND FOCUS KNOB OF FBT AFTER ADJUSTMENT OF FOCUS.


THIS HORIZONTAL LINE MATCHING WITH EXPOSURE POINTS
EXPOSURE POINTS ON THE SCREEN
THIS HORIZONTAL LINE MATCHING WITH EXPOSURE POINTS
EXPOSURE POINTS ON THE SCREEN

FOR TFT CPT MODELS: TILT=0 mm TILT CHECK
FOR CONVENTIONAL CPT MODELS: TILT=2 mm
NOTE: DO NOT TOUCH TO ANY PART OF FBT.

FOCUS CHECK

PRODUCT : CTV	STAGE: CONVERGENCE	PCB/ASSY : F.A.	Roadstar	SHEET : 1 OF 2

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET				

CONVERGENCE ADJUSTMENTS

NOTE : Before attempting any convergence adjustments, the receiver should be operated for at leat fifteen minutes.

CENTER CONVERGENCE ADJUSTMENT :

1.Select the Cross-hatch pattern (EU 4CH) .
2.Set the brightness and contrast for well defined pattern.
3. Adjust two tabs of the 4-Pole magnets to change the angle between them . (See fig.-01 & 02) and superimpose red and blue vertical lines in the center area of picture screen.
4.Turn the both tabs at the same time keeping the angle constant to superimpose red and blue horizontal lines at the center of the screen. (See fig-04 & 02)
5.Adjust two tabs of 6-Pole magnets to superimpose red/blue line and green one .Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.
6.Repeat adjustments 3,4,5 keeping in mind red, green and blue movement , because 4-Pole Magnets and 6-Pole Magnets have mutual interaction and make line movement complex.

CIRCUMFERENCE CONVERGENCE ADJUSTMENT:

1. Loosen the clamping screw of deflection yoke slightly to allow the yoke to tilt.
2.Temporarily put a wedge as shown in fig1. (Do not remove cover paper on adhesive part of the wedge.)
3.Tilt front of the deflection yoke up or down to obtain better convergence in circumference (see fig.3). Push the mounted wedge in to the space between picture tube and the yoke, to fix the yoke temporarily.
4.Put other wedge in to bottom space and remove the cover paper to stick.
5.Tilt front of the yoke right or left to obtain better convergence in circumference. (see fig.3)
6.Keep the yoke position and put another wedge in either upper space. Remove cover paper and stick the wedge on picture tube to fix the yoke.
7.Detach the temporarily mounted wedge and put it in another upper space.Stick it on picture tube to fix the yoke.
8.After fixing three wedges , recheck overall convergence. Tighten the screw firmly to fix the yoke and check the yoke is firm.
9.stick three adhesive tapes on wedges as shown in fig.o.

Convergence Adjustment: 2 OF 2

PREPARED BY
CHECKED BY
APPROVED BY

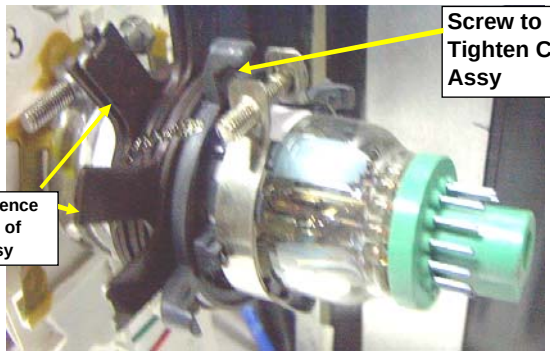


FIG-01

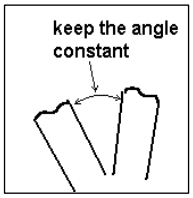


FIG-04

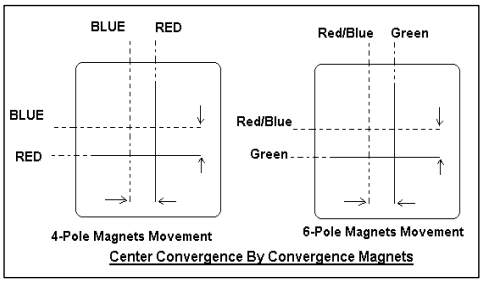


FIG-02

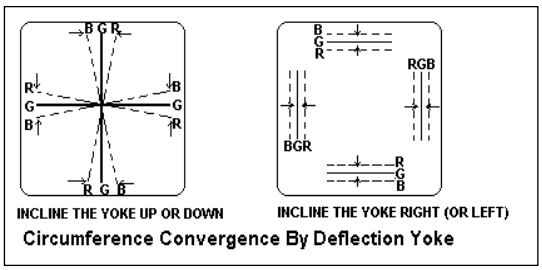


FIG-03

PRODUCT : CTV	STAGE: GEOMETRIC ALIGNMENT		PCB/ASSY :F.A.	Roadstar	SHEET : 1 OF 1
RAW MATERIAL / CONSUMABLES :			JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1			

SELECT RETMA PATTERN (EU 5CH).
PRESS "MENU+6483" KEYS SEQUENCE TO ACCESS THE MANUFACTURING MODE. THEN PRESS HOTKEY "1".
TO ACCESS 'SERVICE MENU-1'.

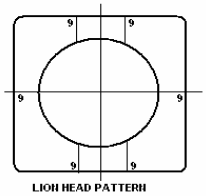
1 .HORIZONTAL CENTERING: H-SHIFT
SELECT PARAMETER "H-SHIFT" BY USING CHANNEL DOWN KEY.
ADJUST "H-SHIFT" VALUE BY USING VOLUME UP/DN KEYS SUCH THAT THE PATTERN IS LOCATED HORIZONTALLY AT CENTRE.

2 VERTICAL LINERITY ADJUSTMENT: V-SLOPE
SELECT "V-SLOPE" & ADJUST IT BY VOLUME UP/DN KEY TO ADJUST CENTRE DOTTED LINE OF RETMA PATTERN TO THE TOP EDGE OF BLACK HALF PATTERN (i.e. EXACTLY THE TOP HALF PORTION OF RETMA PATTERN IS VISIBLE).

3 VERTICAL RASTER SHIFT: V-SHIFT
SELECT "V-SHIFT" AND ADJUST IT SUCH THAT PATTERN WILL APPEAR AT MECHANICAL CENTRE OF THE PICTURE TUBE.

4 VERTICAL HEIGHT** V-SIZE
SELECT "V-SIZE" AND ADJUST IT SUCH THAT HEIGHT OF THE LION HEAD PATTERN BECOMES ' 9 - 9'. ACCEPTABLE RANGE IS 8.9 TO 9.1. (REFER FIG-)

5 VERTICAL SCROLL V-SC
SELECT "V-SC" AND ADJUST IT SUCH THAT BIG CIRCLE WILL LOOK PERFECT CIRCL



LION HEAD PATTERN

USE "STAND BY" KEY TO QUIT THE MANUFACTURING/SERVICE MODE.

PRODUCT : CTV			STAGE: OSD ALIGNMENT	PCB/ASSY :F.A.		Roadstar	SHEET : 1 OF 1
RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1			

PRESS "MENU+6483" KEYS SEQUENCE TO ACCESS THE MANUFACTURING MODE. THEN PRESS HOTKEY "1".

SELECT RETMA PATTERN (EU 5CH).

OSD DISPLAY ADJUSTMENT ** VERTICAL AND HORIZONTAL * OSDH AND OSDV**

SELECT SERVICE MENU -4 BY PRESSING HOTKEY "4"..

A BIG RECTANGLE WILL APPEAR ON SCREEN.

1 SELECT "OSD V-POS" BY CH.DN KEY. AND ADJUST DOTTED RECTANGLE AT THE VERTICAL CENTRE OF SCREEN.

2 SELECT "OSD H-POS" BY CH.DN KEY. AND ADJUST DOTTED RECTANGLE AT THE HORIZONTAL CENTRE OF SCREEN.

USE "STAND BY" KEY TO QUIT THE MANUFACTURING/SERVICE MO

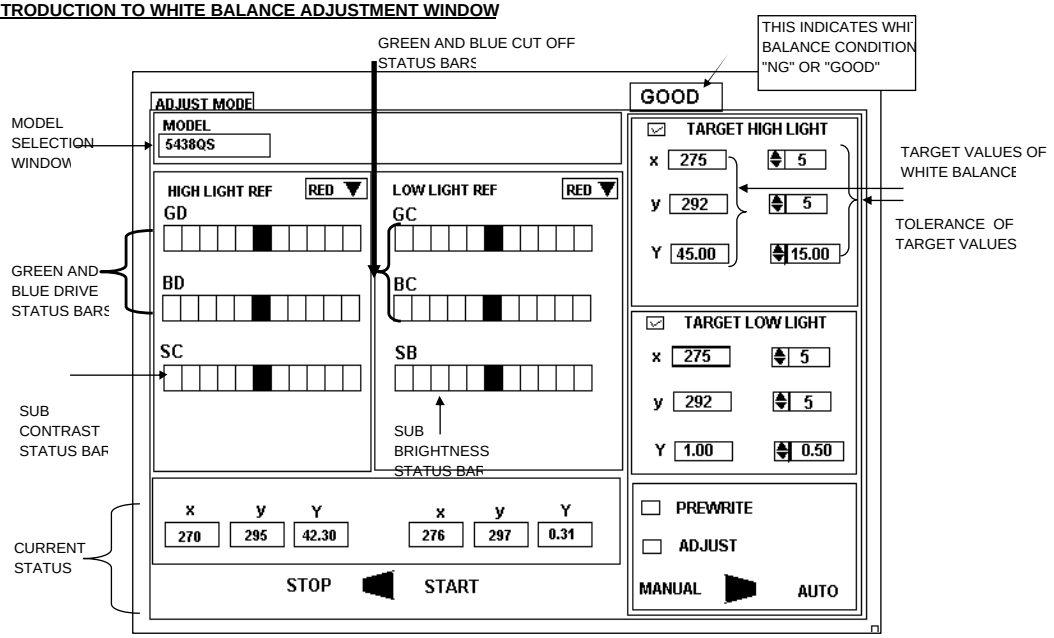
OSD ALIGNMENT ON NTSC PATTERN:

2 SELECT COLOUR BAR+CIRCLE PATTERN (NTSC SYSTEM)

SELECT PARAMETER "OSD V-POS " & "OSD H-POS" BY CHANNEL UP/ DN KEYS . ADJUST THE PARAMETER VALUES SUCH THAT A BIG DOTTED RECTANGLE SHOULD BE SYMMETRICALLY LOCATED ON RETMA PATTERN.

PRODUCT : CTV			STAGE: WHITE BALANCE ADJUSTMENT	PCB/ASSY : F.A.		CHASSIS : AL	SHEET : 1 OF 1
RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1		WHITE BALANCE	

INTRODUCTION TO WHITE BALANCE ADJUSTMENT WINDOW



PRODUCT : CTV	STAGE: WHITE BALANCE ADJUSTMENT	PCB/ASSY : F.A.	Roadstar	SHEET : 2 OF 2

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1		WHITE BALANCE METER	

NOTE : WARM UP THE TV SET FOR AT LEAST 20 MINUTES (DURING SOAKING AREA)
ENSURE "TONE" IN SETTINGS MENU IS "NORMAL" AND SELECTABLE PICTURE MODE IS "STANDARD"..

1 ENSURE THAT THE MODEL NAME DISPLAYED IN 'MODEL INFORMATION WINDOW' IS CORRECT.
2 TV SET WILL STOP IN FRONT OF CAMERA SENSOR ,CONNECT WHITE BALANCE SIGNAL FROM WHITE BALANCE TESTER. TO TUNER INPUT OF SET.
3 AUTO DEGAUSSING WILL START.OBSERVE THAT , WHILE DEGAUSSING ,MONITOR DISPLAY WILL APPEAR VIBRATING.AFTER DEGAUSSING , SENSOR WILL COME FORWARD TILL IT JUST TOUCHES TO SCREEN.
4 ENSURE THAT THE SET POSITION IS SUCH THAT SCREEN WILL BE IN FRONT OF SENSOR.AS WELL AS NEAR TO IT. TAKE CARE THAT NO OSD WILL BE IN FRONT OF SENSOR SO THAT IT WILL NOT GET SENSED BY SENSOR WHILE TESTING AND ADJUSTMENT OF WHITE BALANCE.
5 PRESS "MENU+6483" KEY AND HOTKEY "3" , SELECT SERVICE PARAMETERS FOR RGB CUTOFF
7 ADJUSTMENT & ADJUST IT BY VOL. UP/ VOL. DN KEYS. IF NEEDED ADJUST THE VALUES FOR PARAMETERS OF RGB DRIVES
6 IF NECESSARY, ADJUST THE 'SUB BRIGHTNESS' VALUE BY SELECTING APPROPREATE SERVICE PARAMETER.
7 THE ADJUSTMENTS ARE MUTUALLY INTERDEPENDENT SO ADJUST ALL ABOVE MENTIONED PARAMETERS TILL THE RED BLO BAR COMES AT CENTRE AND "NG" DISPLAY TURNS IN TO "GOOD" .

SERVICE PARAMETERS:-

RGB CUTOFF'S					
UOC/VX05T/ PI	MOC	POC/ROADSTAR	TSB2	VX04T	DSPM2129
RDC	RD	RD	R CUT	RDC	CR
GDC	GD	GD	G CUT	GDC	CG
BDC	BD	BD	B CUT	BDC	CB
RGB DRIVES					
GDRV	GB	GB	GDRV	GDRV	WG
BDRV	RB	RB	BDRV	BDRV	WB
SUB BRIGHTNESS					
SBRT	SBRT	SUB-BRI	BRTS	BRTC	SB

SPECIFICATIONS:
FOR ALL OTHER BRANDS
X= 275+/- 5
y= 292+/- 5
FOR LOW BEAM Y=15
FOR HIGH BEAM Y=113

FOR TOSHIBA BRAND
X= 260
y= 271
FOR LOW BEAM Y= 5
FOR HIGH BEAM Y= 99

USE "STAND BY" KEY TO QUIT THE MANUFACTURING/SERVICE MODE

PRODUCT : CTV	STAGE: SOUND Q.C.-1	PCB/ASSY :F.A.	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		REMOTE	
1			TV SET	1			

1 CONNECT THE RF SIGNAL CORD TO TUNER.
2 CHECK FOR VOLUME VARIATION FROM ZERO TO MAX. (FOR CH-02 & CH-05) SOUND SHOULD BE DISTORTION FREE AT MAX. VOLUME LEVEL.
3 CHECK FOR HISSING SOUND , DISTORTED SOUND PROBLEMS..
4 CHECK SOUND MUTE, AVL.
5 BANG THE CHASSIS FOR LOOSE CONTACT .
6 REMOVE THE RF SIGNAL CORD FROM TUNER.
7 FOR DETAILS, PLEASE REFER USERS GUIDE BOOK

PRODUCT : CTV	STAGE: PICTURE Q.C.-1	PCB/ASSY :F.A.	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS			
1			TV SET	1		SERVICE REMOTE	
2						EXT. DEGAUSSING COIL	CHECKED BY

1 CONNECT RF SIGNAL CORD TO TUNER .
2 SELECT CHANNEL "EU 5CH" .CHECK FOR GEOMETRICAL ALIGNMENTS, DISPLAY ALIGNMENTS,(HEIGHT & WIDTH SHOULD BE HEAD PATTERN.)
LION HEAD PATTERN SHOULD LOOK LINEAR AND SYMMETRICAL .
3 CHECK FOR FOCUS ADJUSTMENT AT DIAGONAL CENTRE OF PICTURE TUBE. '30' DIGITS ON LION HEAD PATTERN SHOULD BE SHARP VISIBLE.
4 PRESS "ZOOM" KEY ON REMOTE TO SELECT "ZOOM' MODE AND CHECK THAT HEIGHT OF THE RETMA PATTERN IS SELECT "WIDE" MODE AND CHECK THAT PATTERN HEIGHT IS 75% OF THE SCREEN.
5 SELECT CROSS HATCH PATTERN (EU 4CH) AND CHECK FOR CONVERGENCE QUALITY. HORIZONTAL AND VERTICAL LINES SHOULD BE WHITE.
6 CHECK FOR SUB BRIGHTNESS ON CHANNEL (EU 2CH).. SUB BRIGHTNESS SHOULD BE SUCH THAT 5 & 1/2 BARS ON SUB BRIGHTNESS PATTERN WITH PICTURE MODE "STANDARD" ARE VISIBLE .
IF REQUIRED ADJUST PARAMETER "SB" IN SERVICE MENU-HOTKEY-3 FOR SPECIFIED SUB BRIGHTNESS ALIGNMENT.
7 CHECK THAT OSD DISPLAY IS NOT CUTTING ON COLOUR BAR+CIRCLE PATTERN WHEN 'ZOOM' MODE IS SELECTED.
8 CHECK FOR P-CONTROL- CONTRAST,BRIGHTNESS,COLOUR ,SHARPNESS.
9 CHECK FOR ALL BANDS TUNING WITH THEIR RESPECTIVE SOUND.
10 CHECK FOR WHITE BALANCE, TILT ALIGNMENT.& COLOUR PATCH.
11 CHECK FOR SELECTABLE PICTURE MODES AS STANDARD,DYNAMIC, MILD , USER.
12 CHECK CPT RELATED PROBLEMS (SCRATCH/CONVERGENCE-DYNAMIC&STATIC / YOKE TILT,CPT GAP OR TILT).
13 CHECK FOR RASTER COLLAPSE DURING SWITCH OFF, CHECK FOR THE PROBLEMS SUCH AS DAMPING BAR, BLOOMING, RETRACE LINES, STRAY EMISSION ETC.
14 FOR DETAILS, PLEASE REFER USERS GUIDE BOOK
USE "STAND BY" KEY TO QUIT THE MANUFACTURING/SERVICE MODE

PRODUCT : CTV	STAGE: TELETEXT CHECKING	PCB/ASSY :F.A.	CHASSIS :RO	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS			
1			TV SET	1		REMOTE	

TELETEXT CHECKING:SELECT COLOUR BAR PATTERN. PRESS "TXT/MIX" KEY ON REMOTE

1 OBSERVE THAT "P100 (INDEX PAGE OF TELETEXT) HAS APPEARED. PRESS "TXT/MIX" KEY AGAIN AND OBSERVE THAT THE TE
2 PAGE HAS SUPERIMPOSED ON THE COLOUR BAR PATTERN. SELECT PAGE "P102" BY USING PROGRAM UP KEY AND OBSER
3 THAT " *** LARGE CHARACTERS *** " PAGE HAS APPEARED. . PRESS "TV/AV" KEY TO QUIT FROM TELETEXT MODE.

4 SELECT SETTINGS MENU AND CHECK THAT TXT=EAST/WEST " FUNCTION.
5 PRESS "SUB CODE " KEY ON REMOTE & CHECK "DK/I/BG" OPTIONS

PRODUCT : CTV	STAGE: NTSC / H.V. CHECKING	PCB/ASSY :F.A.	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS			
1			TV SET	1		REMOTE	
2						HV METER	CHECKED BY
3						HAND GLOVES	
4						BALUN	

NTSC CHECK:

1 SELECT COLOUR BAR+CIRCLE PATTERN.
2 SELECT COLOUR SYSTEM=NTSC IN 'SETTINGS ' MENU.
3 SELECT TINT OPTION IN PICTURE MENU. AND VARY ITS VALUE .
4 WHILE TINT VARIATION ,CHECK THAT RED COLOUR IS CHANGING.
5 IF FOUND ANY ABNORMALITY IN CHECKING , PLEASE REJECT THE SET.

H.V. TEST

1 REMOVE THE MAINS CORD FROM PALLET AND INSERT IT IN HV SOCKET.(SPECIALLY PROVIDED)
2 SNAP SPECIAL BALUN INTO TUNER POINT.
3 TOUCH THE HV TERMINAL TO BALUN POINT.
4 PRESS THE TEST /ENABLE BUTTON ON HV TESTER,IF BUZZER OPERATES FOR UNSPECIFIED TIME THEN REJECT THE SET.
5 REMOVE MAINS CORD FROM SOCKET AND INSERT IN PALLET SOCKET.
6 RELEASE THE SET FOR NEXT STAGE.

AFTER CHECKING, MAKE "M-MODE" ON BY PRESSING "SERVICE KEY+DEMO KEY".
SETTING PARAMETER: 1.1KV, 3mA, FOR 3 SEC.

PRODUCT : CTV	STAGE: NTSC ALIGNMENTS	PCB/ASSY :F.A.	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		NTSC PATTERN	
1			TV SET	1		GENERATOR	
3						SERVICE REMOTE	
4						FOR NTSC ALIGNMENTS	

1 SELECT NTSC PATTERN .(COLOR BAR+CIRCLE PATTERN)
2 PRESS "MENU+6483" KEYS SEQUENCE TO ACCESS THE MANUFACTURING MODE. THEN PRESS HOTKEY "1" TO ENABLE MENU-1.
1 .HORIZONTAL CENTERING: H-SHIFT
SELECT PARAMETER "H-SHIFT" BY USING CHANNEL DOWN KEY.
ADJUST "H-SHIFT" VALUE BY USING VOLUME UP/DN KEYS SUCH THAT THE PATTERN
IS LOCATED HORIZONTALLY AT CENTRE.
2 VERTICAL LINERITY ADJUSTMENT: V-SLOPE
SELECT "V-SLOPE" & ADJUST IT BY VOLUME UP/DN KEY SUCH THAT EXACTLY THE TOP HALF PORTION OF
RETMA PATTERN IS VISIBLE.

3 VERTICAL RASTER SHIFT: V-SHIFT
SELECT "V-SHIFT" AND ADJUST IT SUCH THAT PATTERN WILL APPEAR AT MECHANICAL
CENTRE OF THE PICTURE TUBE.
4 VERTICAL HEIGHT** V-SIZE
SELECT "V-SIZE" AND ADJUST IT SUCH THAT HEIGHT OF THE LION HEAD PATTERN BECOMES ' 9 - 9'.
ACCEPTABLE RANGE IS 8.9 TO 9.1. (REFER FIG-)
5 VERTICAL SCROLL V-SC
SELECT "V-SC" AND ADJUST IT SUCH THAT BIG CIRCLE WILL LOOK PERFECT CIRCLE

PRODUCT : CTV	STAGE: AV CHECKING	PCB/ASSY :F.A.	Road Star	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		REMOTE H-SET	
1			TV SET	1		MONITOR av out SET	
2						AV CORDS	CHECKED BY
3						monitor av in tv set	

CONNECT THE RF SIGNAL CORD TO TUNNER. SELECT CHANNEL "EU 2CH".

AV IN CHECKING -

1 KEEP MONITOR SET IN TV MODE AND 'TESTING TV SET' IN 'EURO AV' MODE BY USING "TV/AV" KEY ON REMOTE.
2 CHANNEL "EU 2CH" IS SELECTED IN MONITOR TV SET.
3 CONNECT "VIDEO OUT" AND "AUDIO OUT" CORD OF MONITOR SET TO "VIDEO IN " AND "AUDIO IN" JACKS OF TESTING TV SET
4 LISTEN FOR NORMAL SOUND AND PICTURE OF CHANNEL "EU 2CH" PRESENT IN THE "TESTING TV SET" .
5 CHECK THE AUDIO FOR BOTH THE AUDIO IN JACKS.

AV OUT CHECKING:-

1 KEEP MONITOR SET IN 'AV' MODE AND 'TESTING TV SET' IN 'TV' MODE BY USING "TV/AV" KEY ON REMOTE.
2 SELECT SUB BRIGHTNESS PATTERN (EU 2CH) ON TESTING TV SET.
3 CONNECT "VIDEO IN" AND "AUDIO IN" CORD OF MONITOR SET TO "VIDEO OUT " AND "AUDIO OUT" JACKS OF TESTING TV SET
4 LISTEN FOR NORMAL SOUND AND PICTURE OF CHANNEL "EU 2CH" PRESENT IN THE "MONITOR TV SET" .
5 REMOVE THE AV CORDS AFTER TESTING.
CHECK "CD PLAY=ON/OFF" FUNCTION IN SOUND MENU

PRODUCT : CTV	STAGE: SOUND Q.C.-2	PCB/ASSY :F.A.	RoadStar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS			
1			TV SET	1		REMOTE	
2						HAMMER	CHECKED BY

1 CONNECT THE RF SIGNAL CORD TO TUNER.
2 CHECK FOR VOLUME VARIATION FROM ZERO TO MAX. (FOR CH-02 & CH-05) SOUND SHOULD BE DISTORTION FREE AT MAX. VOLUME LEVEL.
3 CHECK FOR HISSING SOUND , DISTORTED SOUND PROBLEMS..
4 CHECK SOUND MUTE, AVL.
5 BANG THE CHASSIS FOR LOOSE CONTACT .
6 REMOVE THE RF SIGNAL CORD FROM TUNER.
7 FOR DETAILS, PLEASE REFER USERS GUIDE BOOK.

SHOCK TEST:
1 GENTLY HIT THE HAMMER ON TOP SIDE OF FRONT COVER. CHECK FOR ANY ABNORMALITY

PRODUCT : CTV	STAGE: PICTURE Q.C.-2	PCB/ASSY :F.A.	RoadStar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS			
1			TV SET	1		SERVICE REMOTE	

1 CONNECT RF SIGNAL CORD TO TUNER .
2 SELECT CHANNEL "EU 5CH" .CHECK FOR GEOMETRICAL ALIGNMENTS, DISPLAY ALIGNMENTS,(HEIGHT & WIDTH SHOULD BE HEAD PATTERN.)
LION HEAD PATTERN SHOULD LOOK LINEAR AND SYMMETRICAL .
3 CHECK FOR FOCUS ADJUSTMENT AT DIAGONAL CENTRE OF PICTURE TUBE. '30' DIGITS ON LION HEAD PATTERN SHOULD BE SHARP VISIBLE.
4 PRESS "ZOOM" KEY ON REMOTE TO SELECT "ZOOM' MODE AND CHECK THAT HEIGHT OF THE RETMA PATTERN IS SELECT "WIDE" MODE AND CHECK THAT PATTERN HEIGHT IS 75% OF THE SCREEN.
5 SELECT CROSS HATCH PATTERN (EU 4CH) AND CHECK FOR CONVERGENCE QUALITY. HORIZONTAL AND VERTICAL LINES SHOULD BE WHITE.
6 CHECK FOR SUB BRIGHTNESS ON CHANNEL (EU 2CH).. SUB BRIGHTNESS SHOULD BE SUCH THAT 5 & 1/2 BARS ON SUB BRIGHTNESS PATTERN WITH PICTURE MODE "STANDARD" ARE VISIBLE .
IF REQUIRED ADJUST PARAMETER "SBI" IN SERVICE MENU-HOTKEY-3 FOR SPECIFIED SUB BRIGHTNESS ALIGNMENT.
7 CHECK THAT OSD DISPLAY IS NOT CUTTING ON COLOUR BAR+CIRCLE PATTERN WHEN 'ZOOM' MODE IS SELECTED.
8 CHECK FOR P-CONTROL- CONTRAST,BRIGHTNESS,COLOUR ,SHARPNESS.
9 CHECK FOR ALL BANDS TUNING WITH THEIR RESPECTIVE SOUND.
10 CHECK FOR WHITE BALANCE, TILT ALIGNMENT.& COLOUR PATCH.
11 CHECK FOR SELECTABLE PICTURE MODES AS STANDARD,DYNAMIC, MILD , USER.
13 CHECK CPT RELATED PROBLEMS (SCRATCH/CONVERGENCE-DYNAMIC&STATIC / YOKE TILT,CPT GAP OR TILT).
14 CHECK FOR RASTER COLLAPSE DURING SWITCH OFF, CHECK FOR THE PROBLEMS SUCH AS DAMPING BAR, BLOOMING, RETRACE LINES, STRAY EMISSION ETC.
15 FOR DETAILS, PLEASE REFER USERS GUIDE BOOK

PRODUCT : CTV	STAGE: FEATURE CHECKING	PCB/ASSY :F.A.	RoadStar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS			
1			TV SET	1		REMOTE	

SWITCH ON THE SET.
SELECT FOLLOWING FUNCTIONS -
1 SELECT "SETTINGS" MENU AND CHECK 'EURO AV' FOR 'Y/C, RGB, VIDEO' OPTIONS.
2 IN SETTINGS MENU - CHECK TONE=NORMAL, WARM, COOL.
3 CHECK 'BLACK STRETCH' IN SETTINGS MENU-BRIGHTNESS INCREASES WHEN BLACK STRETCH IS 'OFF'.
4 SELECT "TIMER" MENU AND CHECK THAT ON TIMER, OFF TIMER, REPEAT SETTINGS ARE AVAILABLE.
5 SELECT "SETTINGS--->LANGUAGE" MENU AND CHECK THAT 18 DIFFERENT LANGUAGES ARE AVAILABLE INCLUDING 'ENGLISH'.
6 IN SETTINGS MENU - CHECK BLUE SCREEN ON/OFF (CHECK THIS FEATURE WITHOUT RF SIGNAL)
7 LOCK FUNCTION: PRESS "LOCK" KEY FOR 4 SECOND TO ACTIVATE LOCK FUNCTION . CHECK THAT LOCK MENU WITH DIFF. LC ARE AVAILABLE.
8 REVEAL & HOLD : PRESS "REVEAL" KEY , CHECK THAT TV SWITCHES TO ALL THE TUNNED PROGRAMS AND EURO AV MODE S AND STOPS AT THE PROGRAM TO WHICH "HOLD" KEY IS PRESSED.
9 FOR DETAILS , PLEASE REFER USER'S GUIDE BOOK

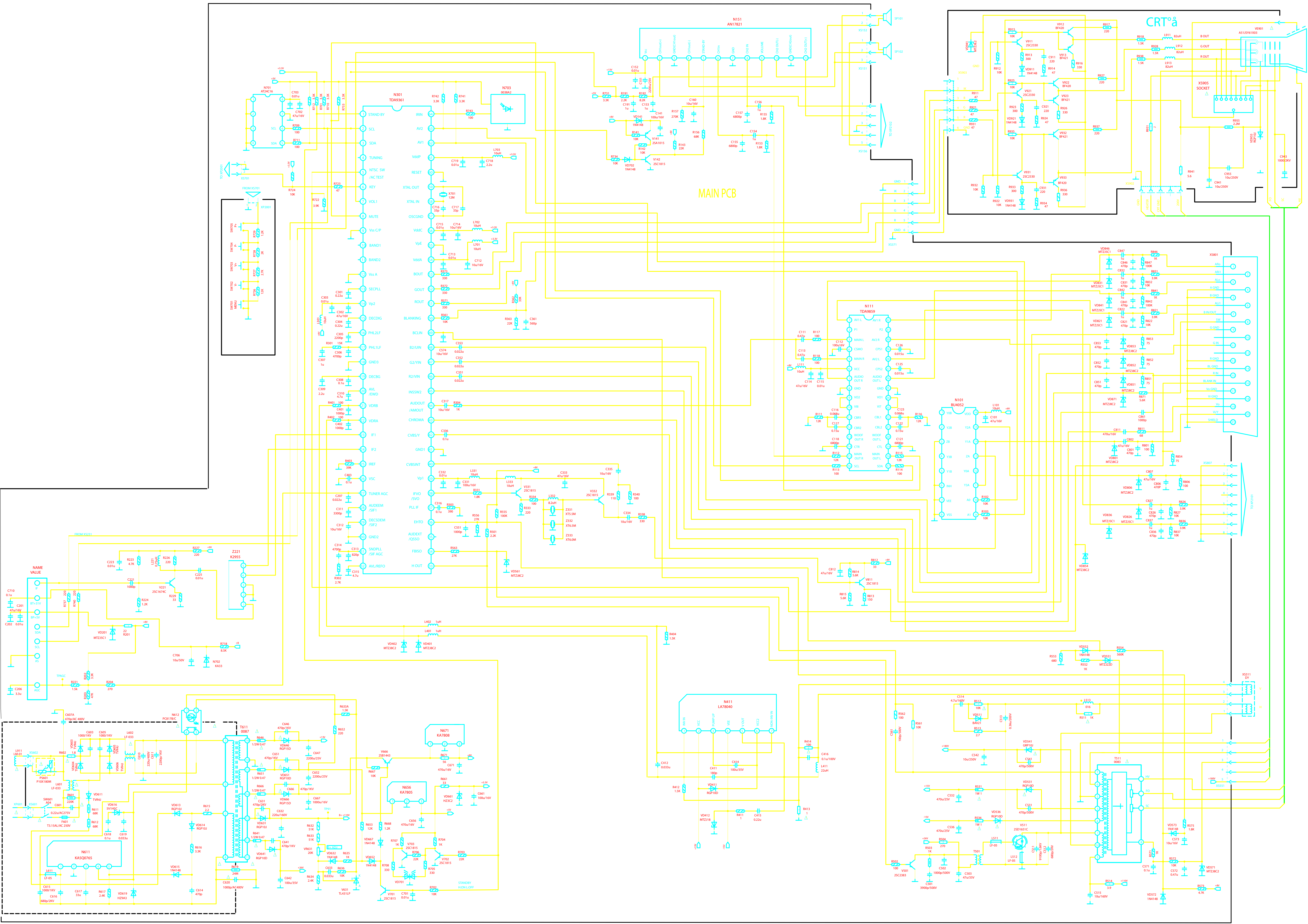
PRODUCT : CTV	STAGE: SHIPPING	PCB/ASSY : F.A.	RoadStar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1			

1 CHECK THE SET IN ALL ASPECTS.
2 PRESS "MENU+6483" KEYS SEQUENCE TO ACCESS THE MANUFACTURING MODE. THEN PRESS HOTKEY "2" TO ENABLE MENU-2.
3 SELECT "SHIPPING" OPTION AND PRESS VOL UP KEY.
4 AFTER SIPPING ,TV SET WILL SWITCH AGAIN.
5 MAKE THE MAINS 'POWER' SWITCH OFF.
USE "STAND BY" KEY TO QUIT THE MANUFACTURING/SERVICE MODE

VILEUR UOC STEREO SCH

2005.10.10



N301
TDA9361
N151
AN17821
N111
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BU4052
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N611
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N671
KA7808
N656
KA7805
N701
AT24C16
N703
0038A2
Z221
K2955
T611
0087
T511
0083
MAIN PCB
CRT
XS905
SOCKET
VE901
A51JSY61X03
XS801
XS511
DY
NAME
VALUE
STANDBY
H:ON L:OFF

VE01 CHASSIS ALLIGNMENT PROCEDURE ON MANUFACTURING LINE

PRODUCT : CTV	STAGE: HARNESING AT F-A LINE	PCB/ASSY :F.A.	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		CUTTER	
1	110006308		TIE,CABLE,PLASTIC,2.5X100mm	2			

1 WRAP THE SPEAKER CONNECTOR TO TIE CABLE METAL SLEEVE AT SPEAKER FITTING SCREW.
2 TIE THE SPEAKER CONNECTOR TO RIGHT SIDE PORTION OF DEGAUSSING COIL SUCH THAT IT WOULD NOT HANG OVER THE CHASSIS.
3 TIE THE DEGUASSING COIL CONNECTOR TO DEGAUSSING COIL.
4 CUT THE EXCESS LENGTH OF ALL THE TIES.
DO NOT LEAVE ANY CUT PORTION OF TIE ON THE CHASSIS.

PRODUCT : CTV	STAGE: SWITCH ON	PCB/ASSY :	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1			

1 BEFORE SWITCHING ON THE TV SET , CHECK THAT CHASSIS DOCKING AND HARNESING HAVE DONE PROPERLY OR NOT.
2 CHECK THAT DEGAUSSING CONNECTOR HAS CONNECTED.
3 CONNECT RF SIGNAL TO TUNER.
4 SWITCH ON THE TV SET AND ADJUST THE 'SCREEN' AND 'FOCUS' POT OF FBT FOR CLEAR PICTURE.
5 CHECK THAT POWER ON LED IS GLOWING WITH NORMAL INTENSITY.
6 CHECK POWER ON/OFF SWITCH OPERATION BY SWITCHING THE SWITCH ON/OFF TWO TO THREE TIMES.
7 CHECK FOR THE PROBLEMS LIKE CPT GAP, SWITCH OFF SPOT, STRAY EMISSION ,ETC.
8 SELECT CHANNEL "EU 2CH" AND CHECK THAT 'SUB BRIGHTNESS' PATTERN HAS APPEARED .
9 CHECK FOR CHANNEL TUNNING, ELSE TUNE THE PROGRAMS USING "AUTO SEARCH" IN SEARCH MENU.
10 CHECK THE VOLUME VARIATION FROM ZERO TO MAXIMUM. OBSERVE THAT VARIATION IS NOT INTERMITANT. IT SHOULD BE
11 CHECK THE OPERATION OF CH UP/ CH DN/ VOL UP/ VOL DN/ MENU KEYS .
12 CHECK THAT THESE KEYS ARE NOT HARD TO OPERATE.
13 CHECK THE TV SET ASTHETICALLY

PRODUCT : CTV	STAGE: +B VOLTAGE ALIGNMENT	PCB/ASSY :F.A.	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		DIGITAL PANEL METER	
1			TV SET	1		ALIGNER	
2						REMOTE	CHECKED BY

1 SWITCH ON THE SET.
2 CONNECT THE RF CORD TO TUNER.
3 SELECT THE 'STANDARD' MODE OF PICTURE CONTROL.
4 CONNECT THE DPM POSITIVE PROBE TO CATHODE OF DIODE "VD631" .
(DPM NEGATIVE PROBE IS INTERNALLY CONNECTED TO CHASSIS GROUND)
5 ROTATE THE PRESET "VR 631" USING ALIGNER TO SET +B VOLTAGE + 115V +/- 0.5V DC

PRODUCT : CTV	STAGE: SCREEN ADJUSTMENT	PCB/ASSY :FA	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1		FEVIBONAD	
2						INSULATED SCREW	CHECKED BY
3						DRIVER	

NOTE : WARM UP THE TV SET FOR AT LEAST 20 MINUTES (DURING SOAKING AREA)

1 SELECT DIGITAL / RETMA / LION HEAD PATTERN ,
2 PRESS "MENU+6483" KEYS SEQUENCE TO ACCESS THE MANUFACTURING MODE.
3 PRESS KEY '3' TO APPEAR 'SERVICE MENU 3' ON SCREEN.
4 SELECT PARAMETER "SC " BY PRESSING CHANNEL UP/DN KEY .
5 PRESS 'VOL UP' KEY THEN A THIN HORIZONTAL LINE WILL BE DISPLAYED ON SCREEN.
6 ADJUST THE SCREEN INTENSITY BY VARYING SCREEN POT OF FBT USING INSULATED SCREW DRIVER UNTIL A THIN HORIZOI LINE IS JUST VISIBLE.
7 PRESS "VOL DN" KEY TO APPEAR ORIGINAL PATTERN.
8 APPLY THE FEVIBOND ON "SCREEN" POT. OF FBT.

PRODUCT : CTV	STAGE: FOCUS AND CONVERGENCE	PCB/ASSY : F.A.	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1		GLUE	
2						PNUE. SCREW DRIVER	CHECKED BY
3							
						FEVIBONAD	
						INSULATED SCREW	APPROVED BY
						DRIVER	

TIGHTENING TORQUE OF SCREW DRIVER- 10 TO 15 kg.cm and TV SET IS FACING TOWARDS EAST.

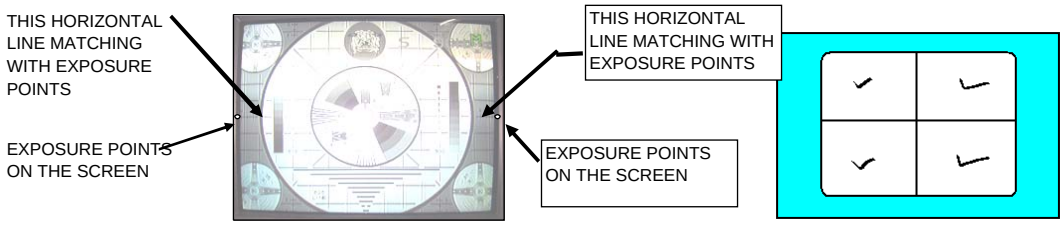
FOCUS ADJUSTMENT :-

1 SELECT LION HEAD PATTERN.(EU 5CH) . CHOOSE SELECTABLE PICTURE MODE "STANDARD".
2 ADJUST THE FOCUS KNOB ON FBT USING INSULATED SCREW DRIVER , SO THAT '30' AT THE DIAGONAL CENTRE ON LION HEA WILL GET AS SHARP AS POSSIBLE.

✓ THIS SYMBOL INDICATES THE LOCATION OF FOCUS ADJUSTMENT CHECK ON SCREEN.

CONVERGENCE ADJUSTMENT :-

1 SWITCH OVER TO CROSS HATCH PATTERN.
2 BY TURNING THE 4 POLE MAGNET, MATCH THE RED AND BLUE LINES AT THE CENTRE. SHIFT THE RED AND BLUE LINE OVER THE GREEN LINE BY USING 6 POLE MAGNET.
3 TIGHTEN THE CPM LOCK. BE CAREFUL NOT TO MOVE THE OTHER RINGS/MAGNETS AT THIS TIME.
4 CHECK AND ADJUST THE PICTURE FOR TILT.ADJUST THE TILT BY ADJUSTING THE YOKE.
5 APPLY GLUE ON BOTH SCREEN AND FOCUS KNOB OF FBT AFTER ADJUSTMENT OF FOCUS.


THIS HORIZONTAL LINE MATCHING WITH EXPOSURE POINTS
EXPOSURE POINTS ON THE SCREEN
THIS HORIZONTAL LINE MATCHING WITH EXPOSURE POINTS
EXPOSURE POINTS ON THE SCREEN

FOR TFT CPT MODELS: TILT=0 mm TILT CHECK
FOR CONVENTIONAL CPT MODELS: TILT=2 mm
NOTE: DO NOT TOUCH TO ANY PART OF FBT.

FOCUS CHECK

PRODUCT : CTV	STAGE: CONVERGENCE	PCB/ASSY : F.A.	Roadstar	SHEET : 1 OF 2

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET				

CONVERGENCE ADJUSTMENTS

NOTE : Before attempting any convergence adjustments, the receiver should be operated for at leat fifteen minutes.

CENTER CONVERGENCE ADJUSTMENT :

1.Select the Cross-hatch pattern (EU 4CH) .
2.Set the brightness and contrast for well defined pattern.
3. Adjust two tabs of the 4-Pole magnets to change the angle between them . (See fig.-01 & 02) and superimpose red and blue vertical lines in the center area of picture screen.
4.Turn the both tabs at the same time keeping the angle constant to superimpose red and blue horizontal lines at the center of the screen. (See fig-04 & 02)
5.Adjust two tabs of 6-Pole magnets to superimpose red/blue line and green one .Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.
6.Repeat adjustments 3,4,5 keeping in mind red, green and blue movement , because 4-Pole Magnets and 6-Pole Magnets have mutual interaction and make line movement complex.

CIRCUMFERENCE CONVERGENCE ADJUSTMENT:

1. Loosen the clamping screw of deflection yoke slightly to allow the yoke to tilt.
2.Temporarily put a wedge as shown in fig1. (Do not remove cover paper on adhesive part of the wedge.)
3.Tilt front of the deflection yoke up or down to obtain better convergence in circumference (see fig.3). Push the mounted wedge in to the space between picture tube and the yoke, to fix the yoke temporarily.
4.Put other wedge in to bottom space and remove the cover paper to stick.
5.Tilt front of the yoke right or left to obtain better convergence in circumference. (see fig.3)
6.Keep the yoke position and put another wedge in either upper space. Remove cover paper and stick the wedge on picture tube to fix the yoke.
7.Detach the temporarily mounted wedge and put it in another upper space.Stick it on picture tube to fix the yoke.
8.After fixing three wedges , recheck overall convergence. Tighten the screw firmly to fix the yoke and check the yoke is firm.
9.stick three adhesive tapes on wedges as shown in fig.o.

Convergence Adjustment: 2 OF 2

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CHECKED BY
APPROVED BY

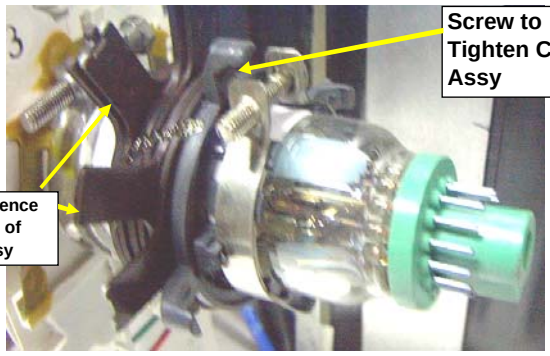


FIG-01

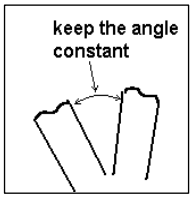


FIG-04

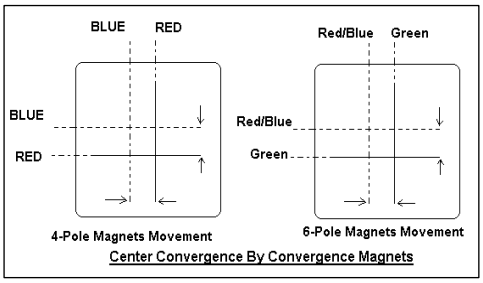


FIG-02

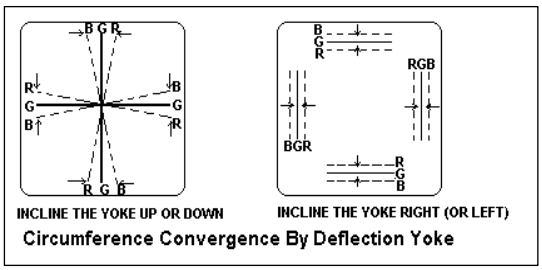


FIG-03

PRODUCT : CTV	STAGE: GEOMETRIC ALIGNMENT		PCB/ASSY :F.A.	Roadstar	SHEET : 1 OF 1
RAW MATERIAL / CONSUMABLES :			JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1			

SELECT RETMA PATTERN (EU 5CH).
PRESS "MENU+6483" KEYS SEQUENCE TO ACCESS THE MANUFACTURING MODE. THEN PRESS HOTKEY "1".
TO ACCESS 'SERVICE MENU-1'.

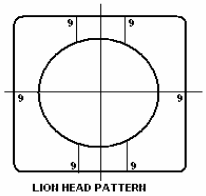
1 .HORIZONTAL CENTERING: H-SHIFT
SELECT PARAMETER "H-SHIFT" BY USING CHANNEL DOWN KEY.
ADJUST "H-SHIFT" VALUE BY USING VOLUME UP/DN KEYS SUCH THAT THE PATTERN IS LOCATED HORIZONTALLY AT CENTRE.

2 VERTICAL LINERITY ADJUSTMENT: V-SLOPE
SELECT "V-SLOPE" & ADJUST IT BY VOLUME UP/DN KEY TO ADJUST CENTRE DOTTED LINE OF RETMA PATTERN TO THE TOP EDGE OF BLACK HALF PATTERN (i.e. EXACTLY THE TOP HALF PORTION OF RETMA PATTERN IS VISIBLE).

3 VERTICAL RASTER SHIFT: V-SHIFT
SELECT "V-SHIFT" AND ADJUST IT SUCH THAT PATTERN WILL APPEAR AT MECHANICAL CENTRE OF THE PICTURE TUBE.

4 VERTICAL HEIGHT** V-SIZE
SELECT "V-SIZE" AND ADJUST IT SUCH THAT HEIGHT OF THE LION HEAD PATTERN BECOMES ' 9 - 9'. ACCEPTABLE RANGE IS 8.9 TO 9.1. (REFER FIG-)

5 VERTICAL SCROLL V-SC
SELECT "V-SC" AND ADJUST IT SUCH THAT BIG CIRCLE WILL LOOK PERFECT CIRCL



LION HEAD PATTERN

USE "STAND BY" KEY TO QUIT THE MANUFACTURING/SERVICE MODE.

PRODUCT : CTV			STAGE: OSD ALIGNMENT	PCB/ASSY :F.A.		Roadstar	SHEET : 1 OF 1
RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1			

PRESS "MENU+6483" KEYS SEQUENCE TO ACCESS THE MANUFACTURING MODE. THEN PRESS HOTKEY "1".

SELECT RETMA PATTERN (EU 5CH).

OSD DISPLAY ADJUSTMENT ** VERTICAL AND HORIZONTAL * OSDH AND OSDV**

SELECT SERVICE MENU -4 BY PRESSING HOTKEY "4"..

A BIG RECTANGLE WILL APPEAR ON SCREEN.

1 SELECT "OSD V-POS" BY CH.DN KEY. AND ADJUST DOTTED RECTANGLE AT THE VERTICAL CENTRE OF SCREEN.

2 SELECT "OSD H-POS" BY CH.DN KEY. AND ADJUST DOTTED RECTANGLE AT THE HORIZONTAL CENTRE OF SCREEN.

USE "STAND BY" KEY TO QUIT THE MANUFACTURING/SERVICE MO

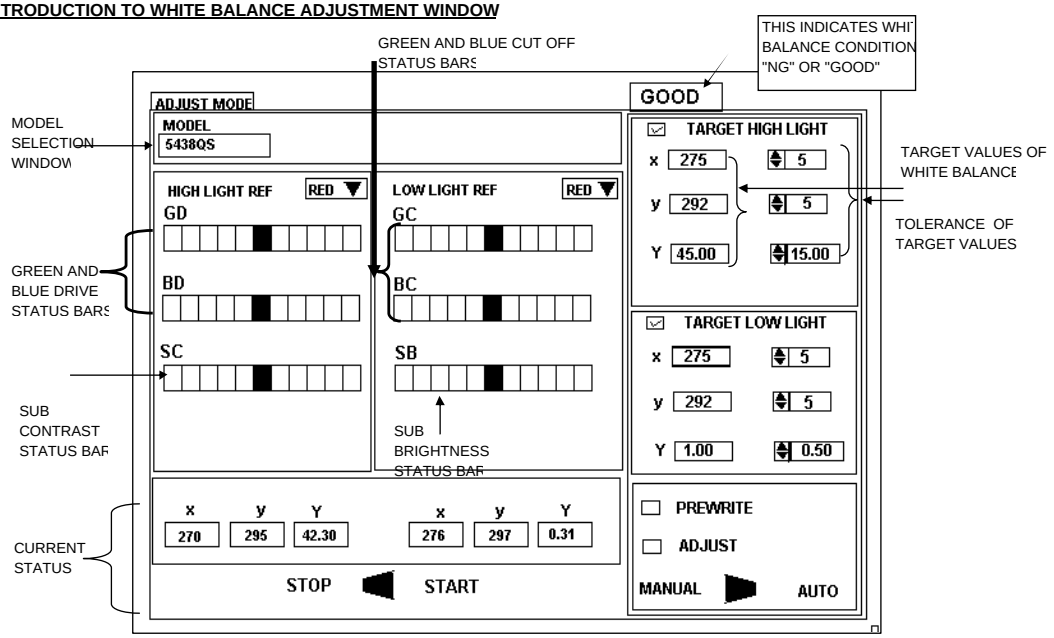
OSD ALIGNMENT ON NTSC PATTERN:

2 SELECT COLOUR BAR+CIRCLE PATTERN (NTSC SYSTEM)

SELECT PARAMETER "OSD V-POS " & "OSD H-POS" BY CHANNEL UP/ DN KEYS . ADJUST THE PARAMETER VALUES SUCH THAT A BIG DOTTED RECTANGLE SHOULD BE SYMMETRICALLY LOCATED ON RETMA PATTERN.

PRODUCT : CTV			STAGE: WHITE BALANCE ADJUSTMENT	PCB/ASSY : F.A.		CHASSIS : AL	SHEET : 1 OF 1
RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1		WHITE BALANCE	

INTRODUCTION TO WHITE BALANCE ADJUSTMENT WINDOW



PRODUCT : CTV	STAGE: WHITE BALANCE ADJUSTMENT	PCB/ASSY : F.A.	Roadstar	SHEET : 2 OF 2

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1		WHITE BALANCE METER	

NOTE : WARM UP THE TV SET FOR AT LEAST 20 MINUTES (DURING SOAKING AREA)
ENSURE "TONE" IN SETTINGS MENU IS "NORMAL" AND SELECTABLE PICTURE MODE IS "STANDARD"..

1 ENSURE THAT THE MODEL NAME DISPLAYED IN 'MODEL INFORMATION WINDOW' IS CORRECT.
2 TV SET WILL STOP IN FRONT OF CAMERA SENSOR ,CONNECT WHITE BALANCE SIGNAL FROM WHITE BALANCE TESTER. TO TUNER INPUT OF SET.
3 AUTO DEGAUSSING WILL START.OBSERVE THAT , WHILE DEGAUSSING ,MONITOR DISPLAY WILL APPEAR VIBRATING.AFTER DEGAUSSING , SENSOR WILL COME FORWARD TILL IT JUST TOUCHES TO SCREEN.
4 ENSURE THAT THE SET POSITION IS SUCH THAT SCREEN WILL BE IN FRONT OF SENSOR.AS WELL AS NEAR TO IT. TAKE CARE THAT NO OSD WILL BE IN FRONT OF SENSOR SO THAT IT WILL NOT GET SENSED BY SENSOR WHILE TESTING AND ADJUSTMENT OF WHITE BALANCE.
5 PRESS "MENU+6483" KEY AND HOTKEY "3" , SELECT SERVICE PARAMETERS FOR RGB CUTOFF
7 ADJUSTMENT & ADJUST IT BY VOL. UP/ VOL. DN KEYS. IF NEEDED ADJUST THE VALUES FOR PARAMETERS OF RGB DRIVES
6 IF NECESSARY, ADJUST THE 'SUB BRIGHTNESS' VALUE BY SELECTING APPROPREATE SERVICE PARAMETER.
7 THE ADJUSTMENTS ARE MUTUALLY INTERDEPENDENT SO ADJUST ALL ABOVE MENTIONED PARAMETERS TILL THE RED BLO BAR COMES AT CENTRE AND "NG" DISPLAY TURNS IN TO "GOOD" .

SERVICE PARAMETERS:-

RGB CUTOFF'S					
UOC/VX05T/ PI	MOC	POC/ROADSTAR	TSB2	VX04T	DSPM2129
RDC	RD	RD	R CUT	RDC	CR
GDC	GD	GD	G CUT	GDC	CG
BDC	BD	BD	B CUT	BDC	CB
RGB DRIVES					
GDRV	GB	GB	GDRV	GDRV	WG
BDRV	RB	RB	BDRV	BDRV	WB
SUB BRIGHTNESS					
SBRT	SBRT	SUB-BRI	BRTS	BRTC	SB

SPECIFICATIONS:
FOR ALL OTHER BRANDS
X= 275+/- 5
y= 292+/- 5
FOR LOW BEAM Y=15
FOR HIGH BEAM Y=113

FOR TOSHIBA BRAND
X= 260
y= 271
FOR LOW BEAM Y= 5
FOR HIGH BEAM Y= 99

USE "STAND BY" KEY TO QUIT THE MANUFACTURING/SERVICE MODE

PRODUCT : CTV	STAGE: SOUND Q.C.-1	PCB/ASSY :F.A.	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		REMOTE	
1			TV SET	1			

1 CONNECT THE RF SIGNAL CORD TO TUNER.
2 CHECK FOR VOLUME VARIATION FROM ZERO TO MAX. (FOR CH-02 & CH-05) SOUND SHOULD BE DISTORTION FREE AT MAX. VOLUME LEVEL.
3 CHECK FOR HISSING SOUND , DISTORTED SOUND PROBLEMS..
4 CHECK SOUND MUTE, AVL.
5 BANG THE CHASSIS FOR LOOSE CONTACT .
6 REMOVE THE RF SIGNAL CORD FROM TUNER.
7 FOR DETAILS, PLEASE REFER USERS GUIDE BOOK

PRODUCT : CTV	STAGE: PICTURE Q.C.-1	PCB/ASSY :F.A.	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS			
1			TV SET	1		SERVICE REMOTE	
2						EXT. DEGAUSSING COIL	CHECKED BY

1 CONNECT RF SIGNAL CORD TO TUNER .
2 SELECT CHANNEL "EU 5CH" .CHECK FOR GEOMETRICAL ALIGNMENTS, DISPLAY ALIGNMENTS,(HEIGHT & WIDTH SHOULD BE HEAD PATTERN.)
LION HEAD PATTERN SHOULD LOOK LINEAR AND SYMMETRICAL .
3 CHECK FOR FOCUS ADJUSTMENT AT DIAGONAL CENTRE OF PICTURE TUBE. '30' DIGITS ON LION HEAD PATTERN SHOULD BE SHARP VISIBLE.
4 PRESS "ZOOM" KEY ON REMOTE TO SELECT "ZOOM' MODE AND CHECK THAT HEIGHT OF THE RETMA PATTERN IS SELECT "WIDE" MODE AND CHECK THAT PATTERN HEIGHT IS 75% OF THE SCREEN.
5 SELECT CROSS HATCH PATTERN (EU 4CH) AND CHECK FOR CONVERGENCE QUALITY. HORIZONTAL AND VERTICAL LINES SHOULD BE WHITE.
6 CHECK FOR SUB BRIGHTNESS ON CHANNEL (EU 2CH).. SUB BRIGHTNESS SHOULD BE SUCH THAT 5 & 1/2 BARS ON SUB BRIGHTNESS PATTERN WITH PICTURE MODE "STANDARD" ARE VISIBLE .
IF REQUIRED ADJUST PARAMETER "SB" IN SERVICE MENU-HOTKEY-3 FOR SPECIFIED SUB BRIGHTNESS ALIGNMENT.
7 CHECK THAT OSD DISPLAY IS NOT CUTTING ON COLOUR BAR+CIRCLE PATTERN WHEN 'ZOOM' MODE IS SELECTED.
8 CHECK FOR P-CONTROL- CONTRAST,BRIGHTNESS,COLOUR ,SHARPNESS.
9 CHECK FOR ALL BANDS TUNING WITH THEIR RESPECTIVE SOUND.
10 CHECK FOR WHITE BALANCE, TILT ALIGNMENT.& COLOUR PATCH.
11 CHECK FOR SELECTABLE PICTURE MODES AS STANDARD,DYNAMIC, MILD , USER.
12 CHECK CPT RELATED PROBLEMS (SCRATCH/CONVERGENCE-DYNAMIC&STATIC / YOKE TILT,CPT GAP OR TILT).
13 CHECK FOR RASTER COLLAPSE DURING SWITCH OFF, CHECK FOR THE PROBLEMS SUCH AS DAMPING BAR, BLOOMING, RETRACE LINES, STRAY EMISSION ETC.
14 FOR DETAILS, PLEASE REFER USERS GUIDE BOOK
USE "STAND BY" KEY TO QUIT THE MANUFACTURING/SERVICE MODE

PRODUCT : CTV	STAGE: TELETEXT CHECKING	PCB/ASSY :F.A.	CHASSIS :RO	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS			
1			TV SET	1		REMOTE	

TELETEXT CHECKING:SELECT COLOUR BAR PATTERN. PRESS "TXT/MIX" KEY ON REMOTE

1 OBSERVE THAT "P100 (INDEX PAGE OF TELETEXT) HAS APPEARED. PRESS "TXT/MIX" KEY AGAIN AND OBSERVE THAT THE TE
2 PAGE HAS SUPERIMPOSED ON THE COLOUR BAR PATTERN. SELECT PAGE "P102" BY USING PROGRAM UP KEY AND OBSER
3 THAT " *** LARGE CHARACTERS *** " PAGE HAS APPEARED. . PRESS "TV/AV" KEY TO QUIT FROM TELETEXT MODE.

4 SELECT SETTINGS MENU AND CHECK THAT TXT=EAST/WEST " FUNCTION.
5 PRESS "SUB CODE " KEY ON REMOTE & CHECK "DK/I/BG" OPTIONS

PRODUCT : CTV	STAGE: NTSC / H.V. CHECKING	PCB/ASSY :F.A.	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS			
1			TV SET	1		REMOTE	
2						HV METER	CHECKED BY
3						HAND GLOVES	
4						BALUN	

NTSC CHECK:

1 SELECT COLOUR BAR+CIRCLE PATTERN.
2 SELECT COLOUR SYSTEM=NTSC IN 'SETTINGS ' MENU.
3 SELECT TINT OPTION IN PICTURE MENU. AND VARY ITS VALUE .
4 WHILE TINT VARIATION ,CHECK THAT RED COLOUR IS CHANGING.
5 IF FOUND ANY ABNORMALITY IN CHECKING , PLEASE REJECT THE SET.

H.V. TEST

1 REMOVE THE MAINS CORD FROM PALLET AND INSERT IT IN HV SOCKET.(SPECIALLY PROVIDED)
2 SNAP SPECIAL BALUN INTO TUNER POINT.
3 TOUCH THE HV TERMINAL TO BALUN POINT.
4 PRESS THE TEST /ENABLE BUTTON ON HV TESTER,IF BUZZER OPERATES FOR UNSPECIFIED TIME THEN REJECT THE SET.
5 REMOVE MAINS CORD FROM SOCKET AND INSERT IN PALLET SOCKET.
6 RELEASE THE SET FOR NEXT STAGE.

AFTER CHECKING, MAKE "M-MODE" ON BY PRESSING "SERVICE KEY+DEMO KEY".
SETTING PARAMETER: 1.1KV, 3mA, FOR 3 SEC.

PRODUCT : CTV	STAGE: NTSC ALIGNMENTS	PCB/ASSY :F.A.	Roadstar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		NTSC PATTERN	
1			TV SET	1		GENERATOR	
3						SERVICE REMOTE	
4						FOR NTSC ALIGNMENTS	

1 SELECT NTSC PATTERN .(COLOR BAR+CIRCLE PATTERN)
2 PRESS "MENU+6483" KEYS SEQUENCE TO ACCESS THE MANUFACTURING MODE. THEN PRESS HOTKEY "1" TO ENABLE MENU-1.
1 .HORIZONTAL CENTERING: H-SHIFT
SELECT PARAMETER "H-SHIFT" BY USING CHANNEL DOWN KEY.
ADJUST "H-SHIFT" VALUE BY USING VOLUME UP/DN KEYS SUCH THAT THE PATTERN
IS LOCATED HORIZONTALLY AT CENTRE.
2 VERTICAL LINERITY ADJUSTMENT: V-SLOPE
SELECT "V-SLOPE" & ADJUST IT BY VOLUME UP/DN KEY SUCH THAT EXACTLY THE TOP HALF PORTION OF
RETMA PATTERN IS VISIBLE.

3 VERTICAL RASTER SHIFT: V-SHIFT
SELECT "V-SHIFT" AND ADJUST IT SUCH THAT PATTERN WILL APPEAR AT MECHANICAL
CENTRE OF THE PICTURE TUBE.
4 VERTICAL HEIGHT** V-SIZE
SELECT "V-SIZE" AND ADJUST IT SUCH THAT HEIGHT OF THE LION HEAD PATTERN BECOMES ' 9 - 9'.
ACCEPTABLE RANGE IS 8.9 TO 9.1. (REFER FIG-)
5 VERTICAL SCROLL V-SC
SELECT "V-SC" AND ADJUST IT SUCH THAT BIG CIRCLE WILL LOOK PERFECT CIRCLE

PRODUCT : CTV	STAGE: AV CHECKING	PCB/ASSY :F.A.	Road Star	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		REMOTE H-SET	
1			TV SET	1		MONITOR av out SET	
2						AV CORDS	CHECKED BY
3						monitor av in tv set	

CONNECT THE RF SIGNAL CORD TO TUNNER. SELECT CHANNEL "EU 2CH".

AV IN CHECKING -

1 KEEP MONITOR SET IN TV MODE AND 'TESTING TV SET' IN 'EURO AV' MODE BY USING "TV/AV" KEY ON REMOTE.
2 CHANNEL "EU 2CH" IS SELECTED IN MONITOR TV SET.
3 CONNECT "VIDEO OUT" AND "AUDIO OUT" CORD OF MONITOR SET TO "VIDEO IN " AND "AUDIO IN" JACKS OF TESTING TV SET
4 LISTEN FOR NORMAL SOUND AND PICTURE OF CHANNEL "EU 2CH" PRESENT IN THE "TESTING TV SET" .
5 CHECK THE AUDIO FOR BOTH THE AUDIO IN JACKS.

AV OUT CHECKING:-

1 KEEP MONITOR SET IN 'AV' MODE AND 'TESTING TV SET' IN 'TV' MODE BY USING "TV/AV" KEY ON REMOTE.
2 SELECT SUB BRIGHTNESS PATTERN (EU 2CH) ON TESTING TV SET.
3 CONNECT "VIDEO IN" AND "AUDIO IN" CORD OF MONITOR SET TO "VIDEO OUT " AND "AUDIO OUT" JACKS OF TESTING TV SET
4 LISTEN FOR NORMAL SOUND AND PICTURE OF CHANNEL "EU 2CH" PRESENT IN THE "MONITOR TV SET" .
5 REMOVE THE AV CORDS AFTER TESTING.
CHECK "CD PLAY=ON/OFF" FUNCTION IN SOUND MENU

PRODUCT : CTV	STAGE: SOUND Q.C.-2	PCB/ASSY :F.A.	RoadStar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS			
1			TV SET	1		REMOTE	
2						HAMMER	CHECKED BY

1 CONNECT THE RF SIGNAL CORD TO TUNER.
2 CHECK FOR VOLUME VARIATION FROM ZERO TO MAX. (FOR CH-02 & CH-05) SOUND SHOULD BE DISTORTION FREE AT MAX. VOLUME LEVEL.
3 CHECK FOR HISSING SOUND , DISTORTED SOUND PROBLEMS..
4 CHECK SOUND MUTE, AVL.
5 BANG THE CHASSIS FOR LOOSE CONTACT .
6 REMOVE THE RF SIGNAL CORD FROM TUNER.
7 FOR DETAILS, PLEASE REFER USERS GUIDE BOOK.

SHOCK TEST:
1 GENTLY HIT THE HAMMER ON TOP SIDE OF FRONT COVER. CHECK FOR ANY ABNORMALITY

PRODUCT : CTV	STAGE: PICTURE Q.C.-2	PCB/ASSY :F.A.	RoadStar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS			
1			TV SET	1		SERVICE REMOTE	

1 CONNECT RF SIGNAL CORD TO TUNER .
2 SELECT CHANNEL "EU 5CH" .CHECK FOR GEOMETRICAL ALIGNMENTS, DISPLAY ALIGNMENTS,(HEIGHT & WIDTH SHOULD BE HEAD PATTERN.)
LION HEAD PATTERN SHOULD LOOK LINEAR AND SYMMETRICAL .
3 CHECK FOR FOCUS ADJUSTMENT AT DIAGONAL CENTRE OF PICTURE TUBE. '30' DIGITS ON LION HEAD PATTERN SHOULD BE SHARP VISIBLE.
4 PRESS "ZOOM" KEY ON REMOTE TO SELECT "ZOOM' MODE AND CHECK THAT HEIGHT OF THE RETMA PATTERN IS SELECT "WIDE" MODE AND CHECK THAT PATTERN HEIGHT IS 75% OF THE SCREEN.
5 SELECT CROSS HATCH PATTERN (EU 4CH) AND CHECK FOR CONVERGENCE QUALITY. HORIZONTAL AND VERTICAL LINES SHOULD BE WHITE.
6 CHECK FOR SUB BRIGHTNESS ON CHANNEL (EU 2CH).. SUB BRIGHTNESS SHOULD BE SUCH THAT 5 & 1/2 BARS ON SUB BRIGHTNESS PATTERN WITH PICTURE MODE "STANDARD" ARE VISIBLE .
IF REQUIRED ADJUST PARAMETER "SBI" IN SERVICE MENU-HOTKEY-3 FOR SPECIFIED SUB BRIGHTNESS ALIGNMENT.
7 CHECK THAT OSD DISPLAY IS NOT CUTTING ON COLOUR BAR+CIRCLE PATTERN WHEN 'ZOOM' MODE IS SELECTED.
8 CHECK FOR P-CONTROL- CONTRAST,BRIGHTNESS,COLOUR ,SHARPNESS.
9 CHECK FOR ALL BANDS TUNING WITH THEIR RESPECTIVE SOUND.
10 CHECK FOR WHITE BALANCE, TILT ALIGNMENT.& COLOUR PATCH.
11 CHECK FOR SELECTABLE PICTURE MODES AS STANDARD,DYNAMIC, MILD , USER.
13 CHECK CPT RELATED PROBLEMS (SCRATCH/CONVERGENCE-DYNAMIC&STATIC / YOKE TILT,CPT GAP OR TILT).
14 CHECK FOR RASTER COLLAPSE DURING SWITCH OFF, CHECK FOR THE PROBLEMS SUCH AS DAMPING BAR, BLOOMING, RETRACE LINES, STRAY EMISSION ETC.
15 FOR DETAILS, PLEASE REFER USERS GUIDE BOOK

PRODUCT : CTV	STAGE: FEATURE CHECKING	PCB/ASSY :F.A.	RoadStar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS			
1			TV SET	1		REMOTE	

SWITCH ON THE SET.
SELECT FOLLOWING FUNCTIONS -
1 SELECT "SETTINGS" MENU AND CHECK 'EURO AV' FOR 'Y/C, RGB, VIDEO' OPTIONS.
2 IN SETTINGS MENU - CHECK TONE=NORMAL, WARM, COOL.
3 CHECK 'BLACK STRETCH' IN SETTINGS MENU-BRIGHTNESS INCREASES WHEN BLACK STRETCH IS 'OFF'.
4 SELECT "TIMER" MENU AND CHECK THAT ON TIMER, OFF TIMER, REPEAT SETTINGS ARE AVAILABLE.
5 SELECT "SETTINGS--->LANGUAGE" MENU AND CHECK THAT 18 DIFFERENT LANGUAGES ARE AVAILABLE INCLUDING 'ENGLISH'.
6 IN SETTINGS MENU - CHECK BLUE SCREEN ON/OFF (CHECK THIS FEATURE WITHOUT RF SIGNAL)
7 LOCK FUNCTION: PRESS "LOCK" KEY FOR 4 SECOND TO ACTIVATE LOCK FUNCTION . CHECK THAT LOCK MENU WITH DIFF. LC ARE AVAILABLE.
8 REVEAL & HOLD : PRESS "REVEAL" KEY , CHECK THAT TV SWITCHES TO ALL THE TUNNED PROGRAMS AND EURO AV MODE S AND STOPS AT THE PROGRAM TO WHICH "HOLD" KEY IS PRESSED.
9 FOR DETAILS , PLEASE REFER USER'S GUIDE BOOK

PRODUCT : CTV	STAGE: SHIPPING	PCB/ASSY : F.A.	RoadStar	SHEET : 1 OF 1

RAW MATERIAL / CONSUMABLES :					JIGS / FIXTURE	INSTRUMENTS :	PREPARED BY
SR N	STOCK NO	LOC	DESCRIPTION	QPS		SERVICE REMOTE	
1			TV SET	1			

1 CHECK THE SET IN ALL ASPECTS.
2 PRESS "MENU+6483" KEYS SEQUENCE TO ACCESS THE MANUFACTURING MODE. THEN PRESS HOTKEY "2" TO ENABLE MENU-2.
3 SELECT "SHIPPING" OPTION AND PRESS VOL UP KEY.
4 AFTER SIPPING ,TV SET WILL SWITCH AGAIN.
5 MAKE THE MAINS 'POWER' SWITCH OFF.
USE "STAND BY" KEY TO QUIT THE MANUFACTURING/SERVICE MODE

n.°	livello	descrizione componenti	quant. x TV	un. di misura	prov.	n.° disegno	codice componente
1	1	1) Assieme televisore finito	1	n.°			
2	2	2) Assieme cabinet frontale	1	n.°			1200004770
3	3	3) cabinet frontale verniciato con scritte	1	n.°	LOCAL		**1600005000**
4	4	4) cabinet frontale non verniciato	1	n.°	LOCAL		1200004919
5	5	5) plastica grezza	825,00	g	LOCAL		**1500001000**
6	4	4) vernice	62,70	g	LOCAL		**1500002000**
7	4	4) inchiostro per scritte	0,03	g	LOCAL		**1500003000**
8	4	4) staffa fissaggio cabinet destra	1	n.°	FA		1200001752
9	4	4) staffa fissaggio cabinet sinistra	1	n.°	FA		1200001751
10	4	4) collante per staffe	0,020	g	FA/LOC		**1600008000**
11	5	5) graniglia per collante	0,002	g	FA/LOC		**1600008001**
12	5	5) solvente	0,018	g	FA/LOC		**1600008002**
13	3	3) pulsante accensione verniciato	1	n.°	LOCAL		**1600006000**
14	4	4) pulsante accensione non verniciato	1	n.°	FA		1200002010
15	5	5) plastica grezza	x	g	LOCAL		**1500001000**
16	4	4) vernice	x	g	LOCAL		**1500002000**
17	3	3) molla pulsante accensione	1	n.°	FA		1100001810
18	3	3) pulsantiera verniciata (5 p.)	1	n.°	LOCAL		**1600007000**
19	4	4) pulsantiera non verniciata	1	n.°	FA		1200004935
20	5	5) plastica grezza	x	g	LOCAL		**1500001000**
21	4	4) vernice	x	g	LOCAL		**1500002000**
22	3	3) vite per fissaggio pulsantiera, 4x12BT	2	n.°	FA/LOC		1100001767
23	3	3) logo ROADSTAR CTV 1450-KT	1	n.°	FA		1100009120
24	3	3) coperchio ricevitore IR	1	n.°	FA		1200001478
25	3	3) lente per led e ricevitore IR	1	n.°	FA		1200001725
26	3	3) rondella cinescopio in gomma, 6x22x3mm	4	n.°	FA/LOC		1100001920
27	3	3) colla per rondelle	0,5	g	FA/LOC		1400000138
28	3	3) cinescopio 14", generico, yammato	1	n.°	vedi tab.	vedi tabella p. 2	vedi tabella
29	3	3) vite per fissaggio cinescopio, 5x20 tipo B	4	n.°	FA/LOC		1100001753
30	3	3) cavo di massa per cinescopio	1	n.°	SKD	JE1----B012-A	1100001506
31	3	3) molla con gancio per tensione cavo di massa	1	n.°	LOCAL	ES14AMP01	**1500005001**
32	3	3) bobina di smagnetizzazione	1	n.°	SKD		1100009192
33	3	3) fascetta in plastica, 2.5x100 mm, bianca	4	n.°	FA/LOC	MG3X0020---G7	1100001860
34	3	3) sostegni per bobina smagnet.- filo gommato	4	n.°	SKD	MB5X0005---E3	**1600002000**
35	3	3) cablaggio giogo, 400 mm	1	n.°	SKD	JS4401-A001-P	1100001480
36	3	3) staffa altoparlante sinistro	1	n.°	FA		1200001403
37	3	3) altoparlante, 16Ω, 3W, Φ 90mm	1	n.°	SKD		1100008482
38	3	3) guarnizione altoparlante	1	n.°	FA		1100003355
39	3	3) connettore altoparlante	1	n.°	SKD	JW2321-C001-A	**1600004000**
40	3	3) vite per fissaggio altoparlante, 4x12BT	2	n.°	FA/LOC		1100001767
41	3	3) nastro in feltro 25mm per bordo altoparlante	0,04	m	FA/LOC		1100001853
42	3	3) cravatta ferma cavo in metallo, 57 mm	1	n.°	FA/LOC		1100001858
43	3	3) assieme chassis 14"	1	n.°	SKD	vedi tabella p. 2	vedi tabella
44	3	3) cappuccio per pulsante accensione	1	n.°	FA		1200000687
45	3	3) cavo di alimentazione 220 V	1	n.°	SKD	JP2202-V004-X	1100009704
46	3	3) filo gommato nero per cavo alim., 100 mm	1	n.°	FA		1100001861
47	3	3) ferma cavo per cavo alimentazione	1	n.°	FA		1200000758
48	3	3) distanziatore cavo ventosa HV	2	n.°	FA	MG3X0040---G2	1100003293
49	3	3) fascetta in plastica, 2.5x100 mm, bianca	4	n.°	FA/LOC		1100001860

Pozza

n.°	livello	descrizione componenti	quant. x TV	un. di misura		n.° disegno	codice componente
50	2	**2) Assieme cabinet posteriore**	1	n.°			1200004764
51	3	3) cabinet posteriore non verniciato	1	n.°	LOCAL		1200004800
52	4	4) plastica grezza	1.181,0	g	LOCAL		**1600001001**
53	3	3) nastro in feltro 25mm	0,6	m	FA/LOC		1100001853
54	3	3) etichetta articolo e codice a barre 80x65mm	1	n.°	LOCAL		**1500008001**
55	3	3) vite per assiemaggio cabinet, 4x16BT	4	n.°	FA/LOC		1100004229
56		**Busta accessori**	1	n.°			
57	3	3) libretto istruzioni	1	n.°	LOCAL		1100009248
58	3	3) scheda di garanzia Roadstar	1	n.°	LOCAL		1100010179
59	3	3) schema circuito elettrico CTV 1450KT, VE02	1	n.°	LOCAL		1100010167
60	3	3) lista Centri Assistenza Tecnica	1	n.°	LOCAL		1100010185
61	3	3) etichetta PVC per schermo (POP)	1	n.°	LOCAL		1100009659
62	3	3) telecomando	1	n.°	SKD	BT-0369A---CB	1100009207
63	3	3) batterie per telecomando 1,5 V, UM3, AA	2	n.°	SKD	MT0X0008---T3	1100002593
64	3	3) busta polietilene 235x330 mm	1	n.°	LOCAL		1300000385
65	1	**1) Scatola imballo TV**	1	n.°			
66	3	3) scatola imballo piana	1	n.°	LOCAL		1300001358
67	3	3) busta TV polietilene, 850x800 mm	1	n.°	LOCAL		1300000388
68	3	3) polistirolo per imballo inferiore (dx e sx)	1	n.°	LOCAL		1300000720 B
69	3	3) polistirolo per imballo superiore (dx e sx)	1	n.°	LOCAL		1300000720 T
70	3	3) etichetta articolo e codice a barre, 57x18 mm	3	n.°	FA		1100001815
71	3	3) nastro adesivo trasparente 72 mm	4,5	m	FA/LOC		1300000769
72		**Materiali di supporto alla lavorazione**					
73	3	3) nastro in carta 12 mm	0,1	m	FA/LOC		1400000151
74	3	3) cartellino di lavorazione "history card"	1	n.°	FA/LOC		1100001770
75	3	3) stagno per saldature	2	g	FA/LOC		1400000301

n.°	livello	descrizione componenti imballo	quant. x imb.	un. di misura	prov.	n.° disegno / specifica	codice componente
1	1	**1) Assieme imballo**					
2	2	2) televisore imballato	20	n.°			
3	2	2) film polietilene estensibile	30	m	LOCAL		**1600009001**

Legenda provenienza: **FA** = India; **SKD** = Cina; **LOCAL** = locale; **FA/LOC** = India o locale

Tabella di correlazione CINESCOPIO / CHASSIS

n°.	Tipo Cinescopio	Provenienza	Codice componente	Tipo Chassis	Provenienza	Codice compon.
1	A34LEX10X	SAMTEL - India	1100001679	VE02 14SMT	SKD	1200004804
2	A34KQW42X01	SAMSUNG SDI - Malaysia	1700001001	VE02 14SMG	SKD	1700002003
3	A33EKC..X..	EKRANAS - Lithuania	1700001002	VE02 14EKR	SKD	1700002004
4						
5						

n.°	livello	descrizione componenti	quant. x TV	un. di misura	prov.	n.° disegno / specifica	codice componente
1	1	1) Assieme televisore finito	1	n.°			
2	2	2) Assieme cabinet frontale	1	n.°			1200004771
3	3	3) cabinet frontale verniciato	1	n.°	LOCAL		**1600005001**
4	4	4) cabinet frontale non verniciato	1	n.°	LOCAL		1200004917
5	5	5) plastica grezza	1.650,0	g	LOCAL		**1500001000**
6	4	4) vernice	116,00	g	LOCAL		**1500002000**
7	4	4) staffa fissaggio cabinet inf. dx	1	n.°	FA		1200001752
8	4	4) staffa fissaggio cabinet inf. sx	1	n.°	FA		1200001751
9	4	4) staffa fissaggio cabinet sup. dx	1	n.°	FA		1200004854
10	4	4) staffa fissaggio cabinet sup. sx	1	n.°	FA		1200004853
11	4	4) collante per staffe	0,040	g	FA/LOC		**1600008000**
12	5	5) graniglia per collante	0,004	g	FA/LOC		**1600008001**
13	5	5) solvente	0,036	g	FA/LOC		**1600008002**
14	3	3) pulsante accensione verniciato	1	n.°	LOCAL		**1600006001**
15	4	4) pulsante accensione non verniciato	1	n.°	FA		1200006100
16	5	5) plastica grezza	x	g	LOCAL		**1500001000**
17	4	4) vernice	x	g	LOCAL		**1500002000**
18	3	3) molla pulsante accensione	1	n.°	FA		1100001808
19	3	3) pulsantiera verniciata (5 p.)	1	n.°	LOCAL		**1600007001**
20	4	4) pulsantiera non verniciata	1	n.°	FA		1200004934
21	5	5) plastica grezza	x	g	LOCAL		**1500001000**
22	4	4) vernice	x	g	LOCAL		**1500002000**
23	3	3) vite per fissaggio pulsantiera, 4x12BT	3	n.°	FA/LOC		1100001767
24	3	3) logo ROADSTAR CTV 1450-KT	1	n.°	FA		1100009120
25	3	3) coperchio ricevitore IR	1	n.°	FA		1200004809
26	3	3) lente per led e ricevitore IR	1	n.°	FA		1200004850
27	3	3) pannello decor. frontale verniciato con scritte	1	n.°	LOCAL		**1500009000**
28	4	4) pannello decor. non verniciato	1	n.°	FA		1200004822
29	5	5) plastica grezza	x	g	LOCAL		**1500004001**
30	4	4) vernice	x	g	LOCAL		**1500002000**
31	4	4) inchiostro per scritte	0,03	g	LOCAL		**1500003000**
32	3	3) vite per fissaggio pannello, 3x12BT	2	n.°	FA/LOC		1100004230
33	3	3) rondella cinescopio, 6x22x3, arancio	4	n.°	FA/LOC		1100001920
34	3	3) colla per rondelle	0,5	g	FA/LOC		1400000138
35	3	3) cinesc. 20", generico, yammato	1	n.°	vedi tab.	vedi tabella p. 2	vedi tabella
36	3	3) vite per fissaggio cinescopio, 5x30 tipo B	4	n.°	FA/LOC		1100001754
37	3	3) cavo di massa per cinesc. + molla e connett.	1	n.°	SKD	JE1----B038-C	1100009128
38	3	3) bobina di smagnetizzazione	1	n.°	SKD		1100009193
39	3	3) sostegni per bobina smagnet.- filo gommato	4	n.°	SKD	MB5X0005---E3	**1600002000**
40	3	3) cablaggio giogo	1	n.°	SKD	JS4501-A002-P	1100003138
41	3	3) staffa altoparlante sinistro	1	n.°	FA		1200003594
42	3	3) staffa altoparlante destro	1	n.°	FA		1200003595
43	3	3) altoparlante 8Ω, 3W, 102 mm	2	n.°	SKD		1100009231
44	3	3) guarnizione altoparlante	2	n.°	FA		1100007706
45	3	3) connett. altop. dx, 400 mm	1	n.°	SKD	JW2401-C002-P	**1500006000**
46	3	3) connett. altop. sx, 400 mm	1	n.°	SKD	JW2401-C003-P	**1600004001**
47	3	3) vite per fissaggio altop. su staffa, 4x12BT	8	n.°	FA/LOC		1100001767
48	3	3) vite fissaggio staffa altop. su cabinet, 4x16BT	4	n.°	FA/LOC		1100004229
49	3	3) rondella piana x altoparlante 4,3x9,5x0,8	2	n.°	FA/LOC		1100001917
50	3	3) cravatta ferma cavo in metallo	2	n.°	FA/LOC		1100001858
51	3	3) assieme chassis 20/21"	1	n.°	SKD	vedi tabella p. 2	vedi tabella
52	3	3) cappuccio per pulsante accensione	1	n.°	FA		1200000687
53	3	3) cavo di alimentazione 220 V	1	n.°	SKD	JP2202-V004-X	1100009704

BOZZA

n.°	livello	descrizione componenti	quant. x TV	un. di misura	prov.	n.° disegno / specifica	codice componente
54	3	3) filo gommato nero, 100 mm, per cavo aliment.	1	n.°	FA		1100001861
55	3	3) ferma cavo per cavo alimentazione	1	n.°	FA		1200000758
56	3	3) distanziatore cavo ventosa HV	2	n.°	FA	MG3X0040---G2	1100003293
57	3	3) fascetta in plastica, 2.5x100 mm, bianca	6	n.°	FA/LOC		1100001860
58	**2**	**2) Assieme cabinet posteriore**	1	n.°			1200004765
59	3	3) cabinet posteriore non verniciato	1	n.°	LOCAL		**1600003000**
60	4	4) plastica grezza	2.079,0	g	LOCAL		**1600001001**
61	3	3) nastro in feltro 25mm	0,8	m	FA/LOC		1100001853
62	3	3) etichetta articolo e codice a barre 80x65mm	1	n.°	LOCAL		**1500008001**
63	3	3) vite per assiemaggio cabinet, 4x16BT	4	n.°	FA/LOC		1100004229
64		**Busta accessori**	1	n.°			
65	3	3) libretto istruzioni CTV-14/20/2150KT	1	n.°	LOCAL		1100009248
66	3	3) scheda di garanzia Roadstar	1	n.°	FA/LOC		1100010179
67	3	3) schema circuito elettrico, 2050/2150KT, VE01	1	n.°	LOCAL		1100010168
68	3	3) lista Centri Assistenza Tecnica	1	n.°	LOCAL		1100010185
69	3	3) etichetta PVC per schermo (POP)	1	n.°	LOCAL		1100009660
70	3	3) telecomando	1	n.°	SKD	BT-0369A---CB	1100009207
71	3	3) batterie per telecomando 1,5 V, UM3, AA	2	n.°	SKD	MT0X0008---T3	1100002593
72	3	3) busta polietilene 235x330 mm	1	n.°	LOCAL		1300000385
73	1	1) Scatola imballo TV	1	n.°			
74	3	3) scatola imballo piana - 2050KT	1	n.°	LOCAL		1300001356
75	3	3) busta TV polietilene, 1100x1050 mm	1	n.°	LOCAL		1300000386
76	3	3) polistirolo per imballo inferiore (dx e sx)	1	n.°	LOCAL	1P-5140	1300001359 B
77	3	3) polistirolo per imballo superiore (dx e sx)	1	n.°	LOCAL	1P-5139	1300001359 T
78	3	3) etichetta articolo e codice a barre, 57x18 mm	3	n.°	FA		1100001815
79	3	3) nastro adesivo trasparente 72 mm	6,0	m	FA/LOC		1300000769
80		**Materiali di supporto alla lavorazione**					
81	3	3) nastro in carta 12 mm	0,1	m	FA/LOC		1400000151
82	3	3) cartellino di lavorazione "history card"	1	n.°	FA/LOC		1100001770
83	3	3) stagno per saldature	2	g	FA/LOC		1400000301

n.°	livello	descrizione componenti imballo	quant. x imb.	un. di misura	prov.	n.° disegno / specifica	codice componente
1	1	1) Assieme imballo					
2	2	2) televisore imballato	8	n.°			
3	2	2) film polietilene estensibile	30	m	LOCAL		**1600009001**

Legenda provenienza: **FA** = India; **SKD** = Cina; **LOCAL** = locale; **FA/LOC** = India o locale

Tabella di correlazione CINESCOPIO / CHASSIS

n°.	Tipo cinescopio	Provenienza	Codice cinescopio	Tipo chassis	Provenienza	Codice chassis
1	A48EAX13X01	THOMSON - Poland	1700003001	VE01 20THM	SKD	1700007001
2	A48KRD89X01	SAMSUNG SDI - Malaysia	1700003002	VE01 20SMG	SKD	1700007002
3	A48EKB..X..	EKRANAS - Lithuania	1700003003	VE01 20EKR	SKD	1700007003
4	A48JSK61X	JCT - TCL - India	1700003004	VE01 20JCT	SKD	1700007004
5						
6						

Bozza

n.°	livello	descrizione componenti	quant. x TV	un. di misura	prov.	n.° disegno / specifica	codice componente
1	1	1) Assieme televisore finito	1	n.°			
2	2	2) Assieme cabinet frontale	1	n.°			1200004772
3	3	3) cabinet frontale verniciato	1	n.°	LOCAL		**1600005101**
4	4	4) cabinet frontale non verniciato	1	n.°	LOCAL		1200004918
5	5	5) plastica grezza	x	g	LOCAL		**1500001000**
6	4	4) vernice	116,0	g	LOCAL		**1500002000**
7	4	4) staffa fissaggio cabinet inf. dx	1	n.°	FA		1200001752
8	4	4) staffa fissaggio cabinet inf. sx	1	n.°	FA		1200001751
9	4	4) staffa fissaggio cabinet sup. dx	1	n.°	FA		1200004854
10	4	4) staffa fissaggio cabinet sup. sx	1	n.°	FA		1200004853
11	4	4) collante per staffe	0,040	g	FA/LOC		**1600008000**
12	5	5) graniglia per collante	0,004	g	FA/LOC		**1600008001**
13	5	5) solvente	0,036	g	FA/LOC		**1600008002**
14	3	3) pulsante accensione verniciato	1	n.°	LOCAL		**1600006001**
15	4	4) pulsante accensione non verniciato	1	n.°	FA		1200006100
16	5	5) plastica grezza	x	g	LOCAL		**1500001000**
17	4	4) vernice	x	g	LOCAL		**1500002000**
18	3	3) molla pulsante accensione	1	n.°	FA		1100001808
19	3	3) pulsantiera verniciata (5 p.)	1	n.°	LOCAL		**1600007001**
20	4	4) pulsantiera non verniciata	1	n.°	FA		1200004934
21	5	5) plastica grezza	x	g	LOCAL		**1500001000**
22	4	4) vernice	x	g	LOCAL		**1500002000**
23	3	3) vite per fissaggio pulsantiera, 4x12BT	3	n.°	FA/LOC		1100001767
24	3	3) logo ROADSTAR CTV 1450-KT	1	n.°	FA		1100009120
25	3	3) coperchio ricevitore IR	1	n.°	FA		1200004809
26	3	3) lente per led e ricevitore IR	1	n.°	FA		1200004850
27	3	3) pannello decor. frontale verniciato con scritte	1	n.°	LOCAL		**1500009000**
28	4	4) pannello decor. non verniciato	1	n.°	FA		1200004822
29	5	5) plastica grezza	x	g	LOCAL		**1500004001**
30	4	4) vernice	x	g	LOCAL		**1500002000**
31	4	4) inchiostro per scritte	0,03	g	LOCAL		**1500003000**
32	3	3) vite per fissaggio pannello, 3x12BT	2	n.°	FA/LOC		1100004230
33	3	3) rondella cinescopio, 10,3x20x4 mm	4	n.°	FA/LOC		1100004624
34	3	3) colla per rondelle	0,5	g	FA/LOC		1400000138
35	3	3) cinesc. 21", generico, yammato	1	n.°	vedi tab.	vedi tabella p. 2	vedi tabella
36	3	3) vite per fissaggio cinescopio, 5x30 tipo B	4	n.°	FA/LOC		1100001754
37	3	3) cavo di massa per cinesc. + molla e connett.	1	n.°	SKD	JE1----B038-C	1100009128
38	3	3) bobina di smagnetizzazione	1	n.°	SKD		1100009193
39	3	3) sostegni per bobina smagnet.- filo gommato	4	n.°	SKD	MB5X0005---E3	**1600002000**
40	3	3) cablaggio giogo	1	n.°	SKD	JS4501-A002-P	1100003138
41	3	3) staffa altoparlante sinistro	1	n.°	FA		1200003594
42	3	3) staffa altoparlante destro	1	n.°	FA		1200003595
43	3	3) altoparlante 8Ω, 3W, 102 mm	2	n.°	SKD		1100009231
44	3	3) guarnizione altoparlante	2	n.°	FA		1100007706
45	3	3) connett. altop. dx, 400 mm	1	n.°	SKD	JW2401-C002-P	**1500006000**
46	3	3) connett. altop. sx, 400 mm	1	n.°	SKD	JW2401-C003-P	**1600004001**
47	3	3) vite per fissaggio altop. su staffa, 4x12BT	8	n.°	FA/LOC		1100001767
48	3	3) vite fissaggio staffa altop. su cabinet, 4x16BT	4	n.°	FA/LOC		1100004229
49	3	3) rondella piana x altoparlante 4,3x9,5x0,8	2	n.°	FA/LOC		1100001917
50	3	3) cravatta ferma cavo in metallo	2	n.°	FA/LOC		1100001858
51	3	3) assieme chassis 20/21"	1	n.°	SKD	vedi tabella p. 2	vedi tabella
52	3	3) cappuccio per pulsante accensione	1	n.°	FA		1200000687
53	3	3) cavo di alimentazione 220 V	1	n.°	SKD	JP2202-V004-X	1100009704

BOZZA

n.°	livello	descrizione componenti	quant. x TV	un. di misura	prov.	n.° disegno / specifica	codice componente
54	3	3) filo gommato nero, 100 mm, per cavo aliment.	1	n.°	FA		1100001861
55	3	3) ferma cavo per cavo alimentazione	1	n.°	FA		1200000758
56	3	3) distanziatore cavo ventosa HV	2	n.°	FA	MG3X0040---G2	1100003293
57	3	3) fascetta in plastica, 2.5x100 mm, bianca	6	n.°	FA/LOC		1100001860
58	**2**	**2) Assieme cabinet posteriore**	1	n.°			1200004766
59	3	3) cabinet posteriore non verniciato	1	n.°	LOCAL		**1600003000**
60	4	4) plastica grezza	2.079,0	g	LOCAL		**1600001001**
61	3	3) nastro in feltro 25mm	0,8	m	FA/LOC		1100001853
62	3	3) etichetta articolo e codice a barre 80x65mm	1	n.°	LOCAL		**1500008001**
63	3	3) vite per assiemaggio cabinet, 4x16BT	4	n.°	FA/LOC		1100004229
64		Busta accessori	1	n.°			
65	3	3) libretto istruzioni CTV-14/20/2150KT	1	n.°	LOCAL		1100009248
66	3	3) scheda di garanzia Roadstar	1	n.°	FA/LOC		1100010179
67	3	3) schema circuito elettrico, 2050/2150KT, VE01	1	n.°	LOCAL		1100010168
68	3	3) lista Centri Assistenza Tecnica	1	n.°	LOCAL		1100010185
69	3	3) etichetta PVC per schermo (POP)	1	n.°	LOCAL		1100009661
70	3	3) telecomando	1	n.°	SKD	BT-0369A---CB	1100009207
71	3	3) batterie per telecomando 1,5 V, UM3, AA	2	n.°	SKD	MT0X0008---T3	1100002593
72	3	3) busta polietilene 235x330 mm	1	n.°	LOCAL		1300000385
73	1	1) Scatola imballo TV	1	n.°			
74	3	3) scatola imballo piana - 2150KT	1	n.°	LOCAL		1300001357
75	3	3) busta TV polietilene e schiuma 1100x1050 mm	1	n.°	LOCAL		1300000386
76	3	3) polistirolo per imballo inferiore (dx e sx)	1	n.°	LOCAL	1P-5140	1300001359 B
77	3	3) polistirolo per imballo superiore (dx e sx)	1	n.°	LOCAL	1P-5139	1300001359 T
78	3	3) etichetta articolo e codice a barre, 57x18 mm	3	n.°	FA		1100001815
79	3	3) nastro adesivo trasparente 72 mm	6,0	m	FA/LOC		1300000769
80		**Materiali di supporto alla lavorazione**					
81	3	3) nastro in carta 12 mm	0,1	m	FA/LOC		1400000151
82	3	3) cartellino di lavorazione "history card"	1	n.°	FA/LOC		1100001770
83	3	3) stagno per saldature	2	g	FA/LOC		1400000301

n.°	livello	descrizione componenti imballo	quant. x imb.	un. di misura	prov.	n.° disegno / specifica	codice componente
1	1	1) Assieme imballo					
2	2	2) televisore imballato	8	n.°			
3	2	2) film polietilene estensibile	30	m	LOCAL		**1600009001**

Legenda provenienza: **FA** = India; **SKD** = Cina; **LOCAL** = locale; **FA/LOC** = India o locale

Tabella di correlazione CINESCOPIO / CHASSIS

n°.	Tipo cinescopio	Provenienza	Codice cinescopio	Tipo chassis	Provenienza	Codice chassis
1	A51JSY61X	JCT-TCL - India	1700005001	VE01 21JCT	SKD	1700008001
2	A51E....X..	EKRANAS - Lithuania	1700005002	VE01 21EKR	SKD	1700008002
3	A51KQK99X01	SAMSUNG SDI - Malaysia	1700005003	VE01 21SMG	SKD	1700008003
4	A51EFS13X701	THOMSON - Poland	1700005004	VE01 21THM	SKD	1700008004
5						

Pozza